



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C12N 15/12, 15/52, C07K 14/47, C12N 9/00, 5/10, 1/21, A61K 38/17, 39/00, C07K 16/30, 16/32, 16/40, A61K 39/395, 35/12, C07K 19/00, C12N 15/62, 5/00, G01N 33/68, C12Q 1/68, C12N 15/11	A2	(11) International Publication Number: WO 00/60076
		(43) International Publication Date: 12 October 2000 (12.10.00)
(21) International Application Number: PCT/US00/05308 (22) International Filing Date: 15 February 2000 (15.02.00)	(74) Agents: MAKI, David, J. et al.; Seed Intellectual Property Law Group PLLC, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US).	
(30) Priority Data: 09/285,480 2 April 1999 (02.04.99) US 09/339,338 23 June 1999 (23.06.99) US 09/389,681 2 September 1999 (02.09.99) US 09/433,826 3 November 1999 (03.11.99) US	(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
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(54) Title: COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE		
(57) Abstract Compositions and methods for the therapy and diagnosis of cancer, such as breast cancer, are disclosed. Compositions may comprise one or more breast tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a breast tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as breast cancer. Diagnostic methods based on detecting a breast tumor protein, or mRNA encoding such a protein, in a sample are also provided.		

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COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

The present invention relates generally to compositions and methods for the treatment of breast cancer. The invention is more particularly related to polypeptides comprising at least a portion of a protein that is preferentially expressed in breast tumor tissue and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for treatment of breast cancer.

BACKGROUND OF THE INVENTION

Breast cancer is a significant health problem for women in the United States and throughout the world. Although advances have been made in detection and treatment of the disease, breast cancer remains the second leading cause of cancer-related deaths in women, affecting more than 180,000 women in the United States each year. For women in North America, the life-time odds of getting breast cancer are one in eight.

No vaccine or other universally successful method for the prevention or treatment of breast cancer is currently available. Management of the disease currently relies on a combination of early diagnosis (through routine breast screening procedures) and aggressive treatment, which may include one or more of a variety of treatments such as surgery, radiotherapy, chemotherapy and hormone therapy. The course of treatment for a particular breast cancer is often selected based on a variety of prognostic parameters, including an analysis of specific tumor markers. *See, e.g., Porter-Jordan and Lippman, Breast Cancer 8:73-100 (1994).* However, the use of established markers often leads to a result that is difficult to interpret, and the high mortality observed in breast cancer patients indicates that improvements are needed in the treatment, diagnosis and prevention of the disease.

Accordingly, there is a need in the art for improved methods for the treatment and diagnosis of breast cancer. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

The present invention provides compounds and methods for the treatment and diagnosis of cancer, such as breast cancer. In one aspect, isolated polypeptides are provided comprising at least a portion of a breast tumor protein or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with protein-specific antisera is not substantially diminished. With certain embodiments, the polypeptide comprises an amino acid sequence encoded by a polynucleotide selected from the group consisting of: (a) nucleotide sequences recited in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468; (b) complements of said nucleotide sequences; and (c) variants of a sequence of (a) or (b). In specific embodiments, the inventive polypeptides comprise at least a portion of a tumor antigen that comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 62, 176, 179, 181 and 469-473.

In related aspects, isolated polynucleotides encoding the above polypeptides, or a portion thereof (such as a portion encoding at least 15 contiguous amino acid residues of a breast tumor protein), are provided. In specific embodiments, such polynucleotides comprise a sequence selected from the group consisting of sequences provided in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 and variants thereof. The present invention further provides expression vectors comprising the above polynucleotides, together with host cells transformed or transfected with such expression vectors. In preferred embodiments, the host cells are selected from the group consisting of *E. coli*, yeast and mammalian cells.

In another aspect, the present invention provides fusion proteins comprising a first and a second inventive polypeptide or, alternatively, an inventive polypeptide and a known breast tumor antigen.

The present invention also provides pharmaceutical compositions comprising at least one of the above polypeptides, or a polynucleotide encoding such a polypeptide, and a physiologically acceptable carrier, together with vaccines. For prophylactic or therapeutic use, comprising at least one such polypeptide or polynucleotide in combination with an immunostimulant. Pharmaceutical compositions and vaccines comprising one or more of the above fusion proteins are also provided.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a breast tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

In yet another aspect, methods are provided for inhibiting the development of breast cancer in a patient, comprising administering an effective amount of at least one of the above pharmaceutical compositions and/or vaccines.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a breast tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

The polypeptides disclosed herein may be usefully employed in the diagnosis and monitoring of breast cancer. In one aspect of the present invention, methods are provided for detecting a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; and (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in a patient. In preferred embodiments, the binding agent is an antibody, most preferably a monoclonal antibody. The cancer may be breast cancer.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; (b) detecting in the sample an amount of a polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amounts of polypeptide detected in steps (b) and (c).

Within related aspects, the present invention provides antibodies, preferably monoclonal antibodies, that bind to the inventive polypeptides, as well as diagnostic kits comprising such antibodies, and methods of using such antibodies to inhibit the development of breast cancer.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, diagnostic kits comprising the above oligonucleotide probes or primers are provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

BRIEF DESCRIPTION OF THE DRAWING AND SEQUENCE IDENTIFIERS

Fig. 1 shows the results of a Northern blot of the clone SYN18C6 (SEQ ID NO: 40).

SEQ ID NO: 1 is the determined cDNA sequence of JBT2.

SEQ ID NO: 2 is the determined cDNA sequence of JBT6.

SEQ ID NO: 3 is the determined cDNA sequence of JBT7.

SEQ ID NO: 4 is the determined cDNA sequence of JBT10.
SEQ ID NO: 5 is the determined cDNA sequence of JBT13.
SEQ ID NO: 6 is the determined cDNA sequence of JBT14.
SEQ ID NO: 7 is the determined cDNA sequence of JBT15.
SEQ ID NO: 8 is the determined cDNA sequence of JBT16.
SEQ ID NO: 9 is the determined cDNA sequence of JBT17.
SEQ ID NO: 10 is the determined cDNA sequence of JBT22.
SEQ ID NO: 11 is the determined cDNA sequence of JBT25.
SEQ ID NO: 12 is the determined cDNA sequence of JBT28.
SEQ ID NO: 13 is the determined cDNA sequence of JBT32.
SEQ ID NO: 14 is the determined cDNA sequence of JBT33.
SEQ ID NO: 15 is the determined cDNA sequence of JBT34.
SEQ ID NO: 16 is the determined cDNA sequence of JBT36.
SEQ ID NO: 17 is the determined cDNA sequence of JBT37.
SEQ ID NO: 18 is the determined cDNA sequence of JBT51.
SEQ ID NO: 19 is the determined cDNA sequence of JBTT1.
SEQ ID NO: 20 is the determined cDNA sequence of JBTT7.
SEQ ID NO: 21 is the determined cDNA sequence of JBTT11.
SEQ ID NO: 22 is the determined cDNA sequence of JBTT14.
SEQ ID NO: 23 is the determined cDNA sequence of JBTT18.
SEQ ID NO: 24 is the determined cDNA sequence of JBTT19.
SEQ ID NO: 25 is the determined cDNA sequence of JBTT20.
SEQ ID NO: 26 is the determined cDNA sequence of JBTT21.
SEQ ID NO: 27 is the determined cDNA sequence of JBTT22.
SEQ ID NO: 28 is the determined cDNA sequence of JBTT28.
SEQ ID NO: 29 is the determined cDNA sequence of JBTT29.
SEQ ID NO: 30 is the determined cDNA sequence of JBTT33.
SEQ ID NO: 31 is the determined cDNA sequence of JBTT37.
SEQ ID NO: 32 is the determined cDNA sequence of JBTT38.
SEQ ID NO: 33 is the determined cDNA sequence of JBTT47.
SEQ ID NO: 34 is the determined cDNA sequence of JBTT48.

SEQ ID NO: 35 is the determined cDNA sequence of JBTT50.
SEQ ID NO: 36 is the determined cDNA sequence of JBTT51.
SEQ ID NO: 37 is the determined cDNA sequence of JBTT52.
SEQ ID NO: 38 is the determined cDNA sequence of JBTT54.
SEQ ID NO: 39 is the determined cDNA sequence of SYN17F4.
SEQ ID NO: 40 is the determined cDNA sequence of SYN18C6.
SEQ ID NO: 41 is the determined cDNA sequence of SYN19A2.
SEQ ID NO: 42 is the determined cDNA sequence of SYN19C8.
SEQ ID NO: 43 is the determined cDNA sequence of SYN20A12.
SEQ ID NO: 44 is the determined cDNA sequence of SYN20G6.
SEQ ID NO: 45 is the determined cDNA sequence of SYN20G6-2.
SEQ ID NO: 46 is the determined cDNA sequence of SYN21B9.
SEQ ID NO: 47 is the determined cDNA sequence of SYN21B9-2.
SEQ ID NO: 48 is the determined cDNA sequence of SYN21C10.
SEQ ID NO: 49 is the determined cDNA sequence of SYN21G10.
SEQ ID NO: 50 is the determined cDNA sequence of SYN21G10-2.
SEQ ID NO: 51 is the determined cDNA sequence of SYN21G11.
SEQ ID NO: 52 is the determined cDNA sequence of SYN21G11-2.
SEQ ID NO: 53 is the determined cDNA sequence of SYN21H8.
SEQ ID NO: 54 is the determined cDNA sequence of SYN22A10.
SEQ ID NO: 55 is the determined cDNA sequence of SYN22A10-2.
SEQ ID NO: 56 is the determined cDNA sequence of SYN22A12.
SEQ ID NO: 57 is the determined cDNA sequence of SYN22A2.
SEQ ID NO: 58 is the determined cDNA sequence of SYN22B4.
SEQ ID NO: 59 is the determined cDNA sequence of SYN22C2.
SEQ ID NO: 60 is the determined cDNA sequence of SYN22E10.
SEQ ID NO: 61 is the determined cDNA sequence of SYN22F2.
SEQ ID NO: 62 is a predicted amino acid sequence for SYN18C6.
SEQ ID NO: 63 is the determined cDNA sequence of B723P.
SEQ ID NO: 64 is the determined cDNA sequence for B724P.
SEQ ID NO: 65 is the determined cDNA sequence of B770P.

SEQ ID NO: 66 is the determined cDNA sequence of B716P.

SEQ ID NO: 67 is the determined cDNA sequence of B725P.

SEQ ID NO: 68 is the determined cDNA sequence of B717P.

SEQ ID NO: 69 is the determined cDNA sequence of B771P.

SEQ ID NO: 70 is the determined cDNA sequence of B722P.

SEQ ID NO: 71 is the determined cDNA sequence of B726P.

SEQ ID NO: 72 is the determined cDNA sequence of B727P.

SEQ ID NO: 73 is the determined cDNA sequence of B728P.

SEQ ID NO: 74-87 are the determined cDNA sequences of isolated clones which show homology to known sequences.

SEQ ID NO: 88 is the determined cDNA sequence of 13053.

SEQ ID NO: 89 is the determined cDNA sequence of 13057.

SEQ ID NO: 90 is the determined cDNA sequence of 13059.

SEQ ID NO: 91 is the determined cDNA sequence of 13065.

SEQ ID NO: 92 is the determined cDNA sequence of 13067.

SEQ ID NO: 93 is the determined cDNA sequence of 13068.

SEQ ID NO: 94 is the determined cDNA sequence of 13071.

SEQ ID NO: 95 is the determined cDNA sequence of 13072.

SEQ ID NO: 96 is the determined cDNA sequence of 13073.

SEQ ID NO: 97 is the determined cDNA sequence of 13075.

SEQ ID NO: 98 is the determined cDNA sequence of 13078.

SEQ ID NO: 99 is the determined cDNA sequence of 13079.

SEQ ID NO: 100 is the determined cDNA sequence of 13081.

SEQ ID NO: 101 is the determined cDNA sequence of 13082.

SEQ ID NO: 102 is the determined cDNA sequence of 13092.

SEQ ID NO: 103 is the determined cDNA sequence of 13097.

SEQ ID NO: 104 is the determined cDNA sequence of 13101.

SEQ ID NO: 105 is the determined cDNA sequence of 13102.

SEQ ID NO: 106 is the determined cDNA sequence of 13119.

SEQ ID NO: 107 is the determined cDNA sequence of 13131.

SEQ ID NO: 108 is the determined cDNA sequence of 13133.

SEQ ID NO: 109 is the determined cDNA sequence of 13135.
SEQ ID NO: 110 is the determined cDNA sequence of 13139.
SEQ ID NO: 111 is the determined cDNA sequence of 13140.
SEQ ID NO: 112 is the determined cDNA sequence of 13146.
SEQ ID NO: 113 is the determined cDNA sequence of 13147.
SEQ ID NO: 114 is the determined cDNA sequence of 13148.
SEQ ID NO: 115 is the determined cDNA sequence of 13149.
SEQ ID NO: 116 is the determined cDNA sequence of 13151.
SEQ ID NO: 117 is the determined cDNA sequence of 13051
SEQ ID NO: 118 is the determined cDNA sequence of 13052
SEQ ID NO: 119 is the determined cDNA sequence of 13055
SEQ ID NO: 120 is the determined cDNA sequence of 13058
SEQ ID NO: 121 is the determined cDNA sequence of 13062
SEQ ID NO: 122 is the determined cDNA sequence of 13064
SEQ ID NO: 123 is the determined cDNA sequence of 13080
SEQ ID NO: 124 is the determined cDNA sequence of 13093
SEQ ID NO: 125 is the determined cDNA sequence of 13094
SEQ ID NO: 126 is the determined cDNA sequence of 13095
SEQ ID NO: 127 is the determined cDNA sequence of 13096
SEQ ID NO: 128 is the determined cDNA sequence of 13099
SEQ ID NO: 129 is the determined cDNA sequence of 13100
SEQ ID NO: 130 is the determined cDNA sequence of 13103
SEQ ID NO: 131 is the determined cDNA sequence of 13106
SEQ ID NO: 132 is the determined cDNA sequence of 13107
SEQ ID NO: 133 is the determined cDNA sequence of 13108
SEQ ID NO: 134 is the determined cDNA sequence of 13121
SEQ ID NO: 135 is the determined cDNA sequence of 13126
SEQ ID NO: 136 is the determined cDNA sequence of 13129
SEQ ID NO: 137 is the determined cDNA sequence of 13130
SEQ ID NO: 138 is the determined cDNA sequence of 13134
SEQ ID NO: 139 is the determined cDNA sequence of 13141

SEQ ID NO: 140 is the determined cDNA sequence of 13142
SEQ ID NO: 141 is the determined cDNA sequence of 14376
SEQ ID NO: 142 is the determined cDNA sequence of 14377
SEQ ID NO: 143 is the determined cDNA sequence of 14383
SEQ ID NO: 144 is the determined cDNA sequence of 14384
SEQ ID NO: 145 is the determined cDNA sequence of 14387
SEQ ID NO: 146 is the determined cDNA sequence of 14392
SEQ ID NO: 147 is the determined cDNA sequence of 14394
SEQ ID NO: 148 is the determined cDNA sequence of 14398
SEQ ID NO: 149 is the determined cDNA sequence of 14401
SEQ ID NO: 150 is the determined cDNA sequence of 14402
SEQ ID NO: 151 is the determined cDNA sequence of 14405
SEQ ID NO: 152 is the determined cDNA sequence of 14409
SEQ ID NO: 153 is the determined cDNA sequence of 14412
SEQ ID NO: 154 is the determined cDNA sequence of 14414
SEQ ID NO: 155 is the determined cDNA sequence of 14415
SEQ ID NO: 156 is the determined cDNA sequence of 14416
SEQ ID NO: 157 is the determined cDNA sequence of 14419
SEQ ID NO: 158 is the determined cDNA sequence of 14426
SEQ ID NO: 159 is the determined cDNA sequence of 14427
SEQ ID NO: 160 is the determined cDNA sequence of 14375
SEQ ID NO: 161 is the determined cDNA sequence of 14378
SEQ ID NO: 162 is the determined cDNA sequence of 14379
SEQ ID NO: 163 is the determined cDNA sequence of 14380
SEQ ID NO: 164 is the determined cDNA sequence of 14381
SEQ ID NO: 165 is the determined cDNA sequence of 14382
SEQ ID NO: 166 is the determined cDNA sequence of 14388
SEQ ID NO: 167 is the determined cDNA sequence of 14399
SEQ ID NO: 168 is the determined cDNA sequence of 14406
SEQ ID NO: 169 is the determined cDNA sequence of 14407
SEQ ID NO: 170 is the determined cDNA sequence of 14408

SEQ ID NO: 171 is the determined cDNA sequence of 14417

SEQ ID NO: 172 is the determined cDNA sequence of 14418

SEQ ID NO: 173 is the determined cDNA sequence of 14423

SEQ ID NO: 174 is the determined cDNA sequence of 14424

SEQ ID NO: 175 is the determined cDNA sequence of B726P-20

SEQ ID NO: 176 is the predicted amino acid sequence of B726P-20

SEQ ID NO: 177 is a PCR primer

SEQ ID NO: 178 is the determined cDNA sequence of B726P-74

SEQ ID NO: 179 is the predicted amino acid sequence of B726P-74

SEQ ID NO: 180 is the determined cDNA sequence of B726P-79

SEQ ID NO: 181 is the predicted amino acid sequence of B726P-79

SEQ ID NO: 182 is the determined cDNA sequence of 19439.1, showing homology to the mammaglobin gene

SEQ ID NO: 183 is the determined cDNA sequence of 19407.1, showing homology to the human keratin gene

SEQ ID NO: 184 is the determined cDNA sequence of 19428.1, showing homology to human chromosome 17 clone

SEQ ID NO: 185 is the determined cDNA sequence of B808P (19408), showing no significant homology to any known gene

SEQ ID NO: 186 is the determined cDNA sequence of 19460.1, showing no significant homology to any known gene

SEQ ID NO: 187 is the determined cDNA sequence of 19419.1, showing homology to Ig kappa light chain

SEQ ID NO: 188 is the determined cDNA sequence of 19411.1, showing homology to human alpha-1 collagen

SEQ ID NO: 189 is the determined cDNA sequence of 19420.1, showing homology to mus musculus proteinase-3

SEQ ID NO: 190 is the determined cDNA sequence of 19432.1, showing homology to human high motility group box

SEQ ID NO: 191 is the determined cDNA sequence of 19412.1, showing homology to the human plasminogen activator gene

SEQ ID NO: 192 is the determined cDNA sequence of 19415.1, showing homology to mitogen activated protein kinase

SEQ ID NO: 193 is the determined cDNA sequence of 19409.1, showing homology to the chondroitin sulfate proteoglycan protein

SEQ ID NO: 194 is the determined cDNA sequence of 19406.1, showing no significant homology to any known gene

SEQ ID NO: 195 is the determined cDNA sequence of 19421.1, showing homology to human fibronectin

SEQ ID NO: 196 is the determined cDNA sequence of 19426.1, showing homology to the retinoic acid receptor responder 3

SEQ ID NO: 197 is the determined cDNA sequence of 19425.1, showing homology to MyD88 mRNA

SEQ ID NO: 198 is the determined cDNA sequence of 19424.1, showing homology to peptide transporter (TAP-1) mRNA

SEQ ID NO: 199 is the determined cDNA sequence of 19429.1, showing no significant homology to any known gene

SEQ ID NO: 200 is the determined cDNA sequence of 19435.1, showing homology to human polymorphic epithelial mucin

SEQ ID NO: 201 is the determined cDNA sequence of B813P (19434.1), showing homology to human GATA-3 transcription factor

SEQ ID NO: 202 is the determined cDNA sequence of 19461.1, showing homology to the human AP-2 gene

SEQ ID NO: 203 is the determined cDNA sequence of 19450.1, showing homology to DNA binding regulatory factor

SEQ ID NO: 204 is the determined cDNA sequence of 19451.1, showing homology to Na/H exchange regulatory co-factor

SEQ ID NO: 205 is the determined cDNA sequence of 19462.1, showing no significant homology to any known gene

SEQ ID NO: 206 is the determined cDNA sequence of 19455.1, showing homology to human mRNA for histone HAS.Z

SEQ ID NO: 207 is the determined cDNA sequence of 19459.1, showing

homology to PAC clone 179N16

SEQ ID NO: 208 is the determined cDNA sequence of 19464.1, showing no significant homology to any known gene

SEQ ID NO: 209 is the determined cDNA sequence of 19414.1, showing homology to lipophilin B

SEQ ID NO: 210 is the determined cDNA sequence of 19413.1, showing homology to chromosome 17 clone hRPK.209_J_20

SEQ ID NO: 211 is the determined cDNA sequence of 19416.1, showing no significant homology to any known gene

SEQ ID NO: 212 is the determined cDNA sequence of 19437.1, showing homology to human clone 24976 mRNA

SEQ ID NO: 213 is the determined cDNA sequence of 19449.1, showing homology to mouse DNA for PG-M core protein

SEQ ID NO: 214 is the determined cDNA sequence of 19446.1, showing no significant homology to any known gene

SEQ ID NO: 215 is the determined cDNA sequence of 19452.1, showing no significant homology to any known gene

SEQ ID NO: 216 is the determined cDNA sequence of 19483.1, showing no significant homology to any known gene

SEQ ID NO: 217 is the determined cDNA sequence of 19526.1, showing homology to human lipophilin C

SEQ ID NO: 218 is the determined cDNA sequence of 19484.1, showing homology to the secreted cement gland protein XAG-2

SEQ ID NO: 219 is the determined cDNA sequence of 19470.1, showing no significant homology to any known gene

SEQ ID NO: 220 is the determined cDNA sequence of 19469.1, showing homology to the human HLA-DM gene

SEQ ID NO: 221 is the determined cDNA sequence of 19482.1, showing homology to the human pS2 protein gene

SEQ ID NO: 222 is the determined cDNA sequence of B805P (19468.1), showing no significant homology to any known gene

SEQ ID NO: 223 is the determined cDNA sequence of 19467.1, showing homology to human thrombospondin mRNA

SEQ ID NO: 224 is the determined cDNA sequence of 19498.1, showing homology to the CDC2 gene involved in cell cycle control

SEQ ID NO: 225 is the determined cDNA sequence of 19506.1, showing homology to human cDNA for TREB protein

SEQ ID NO: 226 is the determined cDNA sequence of B806P (19505.1), showing no significant homology to any known gene

SEQ ID NO: 227 is the determined cDNA sequence of 19486.1, showing homology to type I epidermal keratin

SEQ ID NO: 228 is the determined cDNA sequence of 19510.1, showing homology to glucose transporter for glycoprotein

SEQ ID NO: 229 is the determined cDNA sequence of 19512.1, showing homology to the human lysyl hydroxylase gene

SEQ ID NO: 230 is the determined cDNA sequence of 19511.1, showing homology to human palmitoyl-protein thioesterase

SEQ ID NO: 231 is the determined cDNA sequence of 19508.1, showing homology to human alpha enolase

SEQ ID NO: 232 is the determined cDNA sequence of B807P (19509.1), showing no significant homology to any known gene

SEQ ID NO: 233 is the determined cDNA sequence of B809P (19520.1), showing homology to clone 102D24 on chromosome 11q13.31

SEQ ID NO: 234 is the determined cDNA sequence of 19507.1, showing homology to prosome beta-subunit

SEQ ID NO: 235 is the determined cDNA sequence of 19525.1, showing homology to human pro-urokinase precursor

SEQ ID NO: 236 is the determined cDNA sequence of 19513.1, showing no significant homology to any known gene

SEQ ID NO: 237 is the determined cDNA sequence of 19517.1, showing homology to human PAC 128M19 clone

SEQ ID NO: 238 is the determined cDNA sequence of 19564.1, showing

homology to human cytochrome P450-IIB

SEQ ID NO: 239 is the determined cDNA sequence of 19553.1, showing homology to human GABA-A receptor pi subunit

SEQ ID NO: 240 is the determined cDNA sequence of B811P (19575.1), showing no significant homology to any known gene

SEQ ID NO: 241 is the determined cDNA sequence of B810P (19560.1), showing no significant homology to any known gene

SEQ ID NO: 242 is the determined cDNA sequence of 19588.1, showing homology to aortic carboxypeptidase-like protein

SEQ ID NO: 243 is the determined cDNA sequence of 19551.1, showing homology to human BCL-1 gene

SEQ ID NO: 244 is the determined cDNA sequence of 19567.1, showing homology to human proteasome-related mRNA

SEQ ID NO: 245 is the determined cDNA sequence of B803P (19583.1), showing no significant homology to any known gene

SEQ ID NO: 246 is the determined cDNA sequence of B812P (19587.1), showing no significant homology to any known gene

SEQ ID NO: 247 is the determined cDNA sequence of B802P (19392.2), showing homology to human chromosome 17

SEQ ID NO: 248 is the determined cDNA sequence of 19393.2, showing homology to human nicein B2 chain

SEQ ID NO: 249 is the determined cDNA sequence of 19398.2, human MHC class II DQ alpha mRNA

SEQ ID NO: 250 is the determined cDNA sequence of B804P (19399.2), showing homology to human Xp22 BAC GSHB-184P14

SEQ ID NO: 251 is the determined cDNA sequence of 19401.2, showing homology to human ikB kinase-b gene

SEQ ID NO: 252 is the determined cDNA sequence of 20266, showing no significant homology to any known gene

SEQ ID NO: 253 is the determined cDNA sequence of B826P (20270), showing no significant homology to any known gene

SEQ ID NO: 254 is the determined cDNA sequence of 20274, showing no significant homology to any known gene

SEQ ID NO: 255 is the determined cDNA sequence of 20276, showing no significant homology to any known gene

SEQ ID NO: 256 is the determined cDNA sequence of 20277, showing no significant homology to any known gene

SEQ ID NO: 257 is the determined cDNA sequence of B823P (20280), showing no significant homology to any known gene

SEQ ID NO: 258 is the determined cDNA sequence of B821P (20281), showing no significant homology to any known gene

SEQ ID NO: 259 is the determined cDNA sequence of B824P (20294), showing no significant homology to any known gene

SEQ ID NO: 260 is the determined cDNA sequence of 20303, showing no significant homology to any known gene

SEQ ID NO: 261 is the determined cDNA sequence of B820P (20310), showing no significant homology to any known gene

SEQ ID NO: 262 is the determined cDNA sequence of B825P (20336), showing no significant homology to any known gene

SEQ ID NO: 263 is the determined cDNA sequence of B827P (20341), showing no significant homology to any known gene

SEQ ID NO: 264 is the determined cDNA sequence of 20941, showing no significant homology to any known gene

SEQ ID NO: 265 is the determined cDNA sequence of 20954, showing no significant homology to any known gene

SEQ ID NO: 266 is the determined cDNA sequence of 20961, showing no significant homology to any known gene

SEQ ID NO: 267 is the determined cDNA sequence of 20965, showing no significant homology to any known gene

SEQ ID NO: 268 is the determined cDNA sequence of 20975, showing no significant homology to any known gene

SEQ ID NO: 269 is the determined cDNA sequence of 20261, showing

homology to Human p120 catenin

SEQ ID NO: 270 is the determined cDNA sequence of B822P (20262), showing homology to Human membrane glycoprotein 4F2

SEQ ID NO: 271 is the determined cDNA sequence of 20265, showing homology to Human Na, K-ATPase Alpha 1

SEQ ID NO: 272 is the determined cDNA sequence of 20267, showing homology to Human heart HS 90, partial cds

SEQ ID NO: 273 is the determined cDNA sequence of 20268, showing homology to Human mRNA GPI-anchored protein p137

SEQ ID NO: 274 is the determined cDNA sequence of 20271, showing homology to Human cleavage stimulation factor 77 kDa subunit

SEQ ID NO: 275 is the determined cDNA sequence of 20272, showing homology to Human p190-B

SEQ ID NO: 276 is the determined cDNA sequence of 20273, showing homology to Human ribophorin

SEQ ID NO: 277 is the determined cDNA sequence of 20278, showing homology to Human ornithine amino transferase

SEQ ID NO: 278 is the determined cDNA sequence of 20279, showing homology to Human S-adenosylmethionine synthetase

SEQ ID NO: 279 is the determined cDNA sequence of 20293, showing homology to Human x inactivation transcript

SEQ ID NO: 280 is the determined cDNA sequence of 20300, showing homology to Human cytochrome p450

SEQ ID NO: 281 is the determined cDNA sequence of 20305, showing homology to Human elongation factor-1 alpha

SEQ ID NO: 282 is the determined cDNA sequence of 20306, showing homology to Human epithelial ets protein

SEQ ID NO: 283 is the determined cDNA sequence of 20307, showing homology to Human signal transducer mRNA

SEQ ID NO: 284 is the determined cDNA sequence of 20313, showing homology to Human GABA-A receptor pi subunit mRNA

SEQ ID NO: 285 is the determined cDNA sequence of 20317, showing homology to Human tyrosine phosphatase

SEQ ID NO: 286 is the determined cDNA sequence of 20318, showing homology to Human cathepsine B proteinase

SEQ ID NO: 287 is the determined cDNA sequence of 20320, showing homology to Human 2-phosphopyruvate-hydratase-alpha-enolase

SEQ ID NO: 288 is the determined cDNA sequence of 20321, showing homology to Human E-cadherin

SEQ ID NO: 289 is the determined cDNA sequence of 20322, showing homology to Human hsp86

SEQ ID NO: 290 is the determined cDNA sequence of B828P (20326), showing homology to Human x inactivation transcript

SEQ ID NO: 291 is the determined cDNA sequence of 20333, showing homology to Human chromatin regulator, SMARCA5

SEQ ID NO: 292 is the determined cDNA sequence of 20335, showing homology to Human sphingolipid activator protein 1

SEQ ID NO: 293 is the determined cDNA sequence of 20337, showing homology to Human hepatocyte growth factor activator inhibitor type 2

SEQ ID NO: 294 is the determined cDNA sequence of 20338, showing homology to Human cell adhesion molecule CD44

SEQ ID NO: 295 is the determined cDNA sequence of 20340, showing homology to Human nuclear factor (erythroid-derived)-like 1

SEQ ID NO: 296 is the determined cDNA sequence of 20938, showing homology to Human vinculin mRNA

SEQ ID NO: 297 is the determined cDNA sequence of 20939, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 298 is the determined cDNA sequence of 20940, showing homology to Human nestin gene

SEQ ID NO: 299 is the determined cDNA sequence of 20942, showing homology to Human pancreatic ribonuclease

SEQ ID NO: 300 is the determined cDNA sequence of 20943, showing

homology to Human transcobalamin I

SEQ ID NO: 301 is the determined cDNA sequence of 20944, showing homology to Human beta-tubulin

SEQ ID NO: 302 is the determined cDNA sequence of 20946, showing homology to Human HS1 protein

SEQ ID NO: 303 is the determined cDNA sequence of 20947, showing homology to Human cathepsin B

SEQ ID NO: 304 is the determined cDNA sequence of 20948, showing homology to Human testis enhanced gene transcript

SEQ ID NO: 305 is the determined cDNA sequence of 20949, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 306 is the determined cDNA sequence of 20950, showing homology to Human ADP-ribosylation factor 3

SEQ ID NO: 307 is the determined cDNA sequence of 20951, showing homology to Human IFP53 or WRS for tryptophanyl-tRNA synthetase

SEQ ID NO: 308 is the determined cDNA sequence of 20952, showing homology to Human cyclin-dependent protein kinase

SEQ ID NO: 308 is the determined cDNA sequence of 20957, showing homology to Human alpha-tubulin sioform 1

SEQ ID NO: 309 is the determined cDNA sequence of 20959, showing homology to Human tyrosine phosphatase-61bp deletion

SEQ ID NO: 310 is the determined cDNA sequence of 20966, showing homology to Human tyrosine phosphatase

SEQ ID NO: 311 is the determined cDNA sequence of B830P (20976), showing homology to Human nuclear factor NF 45

SEQ ID NO: 312 is the determined cDNA sequence of B829P (20977), showing homology to Human delta-6 fatty acid desaturase

SEQ ID NO: 313 is the determined cDNA sequence of 20978, showing homology to Human nuclear aconitase

SEQ ID NO: 314 is the determined cDNA sequence of 19465, showing no significant homology to any known gene.

SEQ ID NO: 315 is the determined cDNA sequence of clone 23176.
SEQ ID NO: 316 is the determined cDNA sequence of clone 23140.
SEQ ID NO: 317 is the determined cDNA sequence of clone 23166.
SEQ ID NO: 318 is the determined cDNA sequence of clone 23167.
SEQ ID NO: 319 is the determined cDNA sequence of clone 23177.
SEQ ID NO: 320 is the determined cDNA sequence of clone 23217.
SEQ ID NO: 321 is the determined cDNA sequence of clone 23169.
SEQ ID NO: 322 is the determined cDNA sequence of clone 23160.
SEQ ID NO: 323 is the determined cDNA sequence of clone 23182.
SEQ ID NO: 324 is the determined cDNA sequence of clone 23232.
SEQ ID NO: 325 is the determined cDNA sequence of clone 23203.
SEQ ID NO: 326 is the determined cDNA sequence of clone 23198.
SEQ ID NO: 327 is the determined cDNA sequence of clone 23224.
SEQ ID NO: 328 is the determined cDNA sequence of clone 23142.
SEQ ID NO: 329 is the determined cDNA sequence of clone 23138.
SEQ ID NO: 330 is the determined cDNA sequence of clone 23147.
SEQ ID NO: 331 is the determined cDNA sequence of clone 23148.
SEQ ID NO: 332 is the determined cDNA sequence of clone 23149.
SEQ ID NO: 333 is the determined cDNA sequence of clone 23172.
SEQ ID NO: 334 is the determined cDNA sequence of clone 23158.
SEQ ID NO: 335 is the determined cDNA sequence of clone 23156.
SEQ ID NO: 336 is the determined cDNA sequence of clone 23221.
SEQ ID NO: 337 is the determined cDNA sequence of clone 23223.
SEQ ID NO: 338 is the determined cDNA sequence of clone 23155.
SEQ ID NO: 339 is the determined cDNA sequence of clone 23225.
SEQ ID NO: 340 is the determined cDNA sequence of clone 23226.
SEQ ID NO: 341 is the determined cDNA sequence of clone 23228.
SEQ ID NO: 342 is the determined cDNA sequence of clone 23229.
SEQ ID NO: 343 is the determined cDNA sequence of clone 23231.
SEQ ID NO: 344 is the determined cDNA sequence of clone 23154.
SEQ ID NO: 345 is the determined cDNA sequence of clone 23157.

SEQ ID NO: 346 is the determined cDNA sequence of clone 23153.
SEQ ID NO: 347 is the determined cDNA sequence of clone 23159.
SEQ ID NO: 348 is the determined cDNA sequence of clone 23152.
SEQ ID NO: 349 is the determined cDNA sequence of clone 23161.
SEQ ID NO: 350 is the determined cDNA sequence of clone 23162.
SEQ ID NO: 351 is the determined cDNA sequence of clone 23163.
SEQ ID NO: 352 is the determined cDNA sequence of clone 23164.
SEQ ID NO: 353 is the determined cDNA sequence of clone 23165.
SEQ ID NO: 354 is the determined cDNA sequence of clone 23151.
SEQ ID NO: 355 is the determined cDNA sequence of clone 23150.
SEQ ID NO: 356 is the determined cDNA sequence of clone 23168.
SEQ ID NO: 357 is the determined cDNA sequence of clone 23146.
SEQ ID NO: 358 is the determined cDNA sequence of clone 23170.
SEQ ID NO: 359 is the determined cDNA sequence of clone 23171.
SEQ ID NO: 360 is the determined cDNA sequence of clone 23145.
SEQ ID NO: 361 is the determined cDNA sequence of clone 23174.
SEQ ID NO: 362 is the determined cDNA sequence of clone 23175.
SEQ ID NO: 363 is the determined cDNA sequence of clone 23144.
SEQ ID NO: 364 is the determined cDNA sequence of clone 23178.
SEQ ID NO: 365 is the determined cDNA sequence of clone 23179.
SEQ ID NO: 366 is the determined cDNA sequence of clone 23180.
SEQ ID NO: 367 is the determined cDNA sequence of clone 23181.
SEQ ID NO: 368 is the determined cDNA sequence of clone 23143.
SEQ ID NO: 369 is the determined cDNA sequence of clone 23183.
SEQ ID NO: 370 is the determined cDNA sequence of clone 23184.
SEQ ID NO: 371 is the determined cDNA sequence of clone 23185.
SEQ ID NO: 372 is the determined cDNA sequence of clone 23186.
SEQ ID NO: 373 is the determined cDNA sequence of clone 23187.
SEQ ID NO: 374 is the determined cDNA sequence of clone 23190.
SEQ ID NO: 375 is the determined cDNA sequence of clone 23189.
SEQ ID NO: 376 is the determined cDNA sequence of clone 23202.

SEQ ID NO: 378 is the determined cDNA sequence of clone 23191.
SEQ ID NO: 379 is the determined cDNA sequence of clone 23188.
SEQ ID NO: 380 is the determined cDNA sequence of clone 23194.
SEQ ID NO: 381 is the determined cDNA sequence of clone 23196.
SEQ ID NO: 382 is the determined cDNA sequence of clone 23195.
SEQ ID NO: 383 is the determined cDNA sequence of clone 23193.
SEQ ID NO: 384 is the determined cDNA sequence of clone 23199.
SEQ ID NO: 385 is the determined cDNA sequence of clone 23200.
SEQ ID NO: 386 is the determined cDNA sequence of clone 23192.
SEQ ID NO: 387 is the determined cDNA sequence of clone 23201.
SEQ ID NO: 388 is the determined cDNA sequence of clone 23141.
SEQ ID NO: 389 is the determined cDNA sequence of clone 23139.
SEQ ID NO: 390 is the determined cDNA sequence of clone 23204.
SEQ ID NO: 391 is the determined cDNA sequence of clone 23205.
SEQ ID NO: 392 is the determined cDNA sequence of clone 23206.
SEQ ID NO: 393 is the determined cDNA sequence of clone 23207.
SEQ ID NO: 394 is the determined cDNA sequence of clone 23208.
SEQ ID NO: 395 is the determined cDNA sequence of clone 23209.
SEQ ID NO: 396 is the determined cDNA sequence of clone 23210.
SEQ ID NO: 397 is the determined cDNA sequence of clone 23211.
SEQ ID NO: 398 is the determined cDNA sequence of clone 23212.
SEQ ID NO: 399 is the determined cDNA sequence of clone 23214.
SEQ ID NO: 400 is the determined cDNA sequence of clone 23215.
SEQ ID NO: 401 is the determined cDNA sequence of clone 23216.
SEQ ID NO: 402 is the determined cDNA sequence of clone 23137.
SEQ ID NO: 403 is the determined cDNA sequence of clone 23218.
SEQ ID NO: 404 is the determined cDNA sequence of clone 23220.
SEQ ID NO: 405 is the determined cDNA sequence of clone 19462.
SEQ ID NO: 406 is the determined cDNA sequence of clone 19430.
SEQ ID NO: 407 is the determined cDNA sequence of clone 19407.
SEQ ID NO: 408 is the determined cDNA sequence of clone 19448.

SEQ ID NO: 409 is the determined cDNA sequence of clone 19447.
SEQ ID NO: 410 is the determined cDNA sequence of clone 19426.
SEQ ID NO: 411 is the determined cDNA sequence of clone 19441.
SEQ ID NO: 412 is the determined cDNA sequence of clone 19454.
SEQ ID NO: 413 is the determined cDNA sequence of clone 19463.
SEQ ID NO: 414 is the determined cDNA sequence of clone 19419.
SEQ ID NO: 415 is the determined cDNA sequence of clone 19434.
SEQ ID NO: 416 is the determined extended cDNA sequence of B820P.
SEQ ID NO: 417 is the determined extended cDNA sequence of B821P.
SEQ ID NO: 418 is the determined extended cDNA sequence of B822P.
SEQ ID NO: 419 is the determined extended cDNA sequence of B823P.
SEQ ID NO: 420 is the determined extended cDNA sequence of B824P.
SEQ ID NO: 421 is the determined extended cDNA sequence of B825P.
SEQ ID NO: 422 is the determined extended cDNA sequence of B826P.
SEQ ID NO: 423 is the determined extended cDNA sequence of B827P.
SEQ ID NO: 424 is the determined extended cDNA sequence of B828P.
SEQ ID NO: 425 is the determined extended cDNA sequence of B829P.
SEQ ID NO: 426 is the determined extended cDNA sequence of B830P.
SEQ ID NO: 427 is the determined cDNA sequence of clone 266B4.
SEQ ID NO: 428 is the determined cDNA sequence of clone 22892.
SEQ ID NO: 429 is the determined cDNA sequence of clone 266G3.
SEQ ID NO: 430 is the determined cDNA sequence of clone 22890.
SEQ ID NO: 431 is the determined cDNA sequence of clone 264B4.
SEQ ID NO: 432 is the determined cDNA sequence of clone 22883.
SEQ ID NO: 433 is the determined cDNA sequence of clone 22882.
SEQ ID NO: 434 is the determined cDNA sequence of clone 22880.
SEQ ID NO: 435 is the determined cDNA sequence of clone 263G1.
SEQ ID NO: 436 is the determined cDNA sequence of clone 263G6.
SEQ ID NO: 437 is the determined cDNA sequence of clone 262B2.
SEQ ID NO: 438 is the determined cDNA sequence of clone 262B6.
SEQ ID NO: 439 is the determined cDNA sequence of clone 22869.

SEQ ID NO: 440 is the determined cDNA sequence of clone 21374.
SEQ ID NO: 441 is the determined cDNA sequence of clone 21362.
SEQ ID NO: 442 is the determined cDNA sequence of clone 21349.
SEQ ID NO: 443 is the determined cDNA sequence of clone 21309.
SEQ ID NO: 444 is the determined cDNA sequence of clone 21097.
SEQ ID NO: 445 is the determined cDNA sequence of clone 21096.
SEQ ID NO: 446 is the determined cDNA sequence of clone 21094.
SEQ ID NO: 447 is the determined cDNA sequence of clone 21093.
SEQ ID NO: 448 is the determined cDNA sequence of clone 21091.
SEQ ID NO: 449 is the determined cDNA sequence of clone 21089.
SEQ ID NO: 450 is the determined cDNA sequence of clone 21087.
SEQ ID NO: 451 is the determined cDNA sequence of clone 21085.
SEQ ID NO: 452 is the determined cDNA sequence of clone 21084.
SEQ ID NO: 453 is a first partial cDNA sequence of clone 2BT1-40.
SEQ ID NO: 454 is a second partial cDNA sequence of clone 2BT1-40.
SEQ ID NO: 455 is the determined cDNA sequence of clone 21063.
SEQ ID NO: 456 is the determined cDNA sequence of clone 21062.
SEQ ID NO: 457 is the determined cDNA sequence of clone 21060.
SEQ ID NO: 458 is the determined cDNA sequence of clone 21053.
SEQ ID NO: 459 is the determined cDNA sequence of clone 21050.
SEQ ID NO: 460 is the determined cDNA sequence of clone 21036.
SEQ ID NO: 461 is the determined cDNA sequence of clone 21037.
SEQ ID NO: 462 is the determined cDNA sequence of clone 21048.

SEQ ID NO: 463 is a consensus DNA sequence of B726P (referred to as B726P-spliced_seq_B726P).

SEQ ID NO: 464 is the determined cDNA sequence of a second splice form of B726P (referred to as 27490.seq_B726P).

SEQ ID NO: 465 is the determined cDNA sequence of a third splice form of B726P (referred to as 27068.seq_B726P).

SEQ ID NO: 466 is the determined cDNA sequence of a second splice form of B726P (referred to as 23113.seq_B726P).

SEQ ID NO: 467 is the determined cDNA sequence of a second splice form of B726P (referred to as 23103.seq_B726P).

SEQ ID NO: 468 is the determined cDNA sequence of a second splice form of B726P (referred to as 19310.seq_B726P).

SEQ ID NO: 469 is the predicted amino acid sequence encoded by the upstream ORF of SEQ ID NO: 463.

SEQ ID NO: 470 is the predicted amino acid sequence encoded by SEQ ID NO: 464.

SEQ ID NO: 471 is the predicted amino acid sequence encoded by SEQ ID NO: 465.

SEQ ID NO: 472 is the predicted amino acid sequence encoded by SEQ ID NO: 466.

SEQ ID NO: 473 is the predicted amino acid sequence encoded by SEQ ID NO: 467.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as breast cancer. The compositions described herein may include breast tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a breast tumor protein or a variant thereof. A "breast tumor protein" is a protein that is expressed in breast tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain breast tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with breast cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of

binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human breast tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NOS:1-175, 178, 180 and 182-468.

BREAST TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a breast tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a breast tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a breast tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes a breast tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide

sequence that encodes a native breast tumor protein or a portion thereof. The term "variants" also encompasses homologous genes of xenogenic origin.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) *Atlas of Protein Sequence and Structure*, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenies pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad., Sci. USA* 80:726-730.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two

sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native breast tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least five fold greater in a breast tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially

as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as breast tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable library (e.g., a breast tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (e.g., by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (see Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed

using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids. Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Certain nucleic acid sequences of cDNA molecules encoding portions of breast tumor proteins are provided in SEQ ID NO: 1-175, 178, 180 and 182-468. The

isolation of these sequences is described in detail below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (*see* Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a breast tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (*e.g.*, by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a breast tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and

still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). The polynucleotides may also be administered as naked plasmid vectors. Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

BREAST TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a breast tumor protein or a variant thereof, as described herein. As noted above, a "breast tumor protein" is a protein that is expressed by breast tumor cells. Proteins that are breast tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with breast cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is

recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a breast tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native breast tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native breast tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native breast tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially

diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, higher eukaryotic and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at

least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al.,

Proc. Natl. Acad. Sci. USA 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986).

LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology* 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a breast tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a breast tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a breast tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be

determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as breast cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a breast tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g.*, mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically.

Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane,

Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and

immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a breast tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from Nexell Therapeutics Inc., Irvine, CA (see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a breast tumor polypeptide, polynucleotide encoding a breast tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a breast tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a breast tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased

rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a breast tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a breast tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Breast tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a breast tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a breast tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a breast tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a breast tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant

may be any substance that enhances an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (*e.g.*, vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993;

and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants

are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF- α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (*see* US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153,

or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells

or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (see Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (see Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc γ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell

surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a breast tumor protein (or portion or other variant thereof) such that the breast tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the breast tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as breast cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or

following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example,

antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever et al., *Immunological Reviews* 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100 μ g to 5 mg per kg of

host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a breast tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more breast tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as breast cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a breast tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.,* Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length breast tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of

binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.,* Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.,* incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with breast cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined

by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as breast cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond

to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use breast tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such breast tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a breast tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a breast tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with polypeptide (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of breast tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a breast tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a breast tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the breast tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a breast tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a breast tumor protein that is at least 10 nucleotides,

and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NOS:1-175, 178, 180 and 182-468. Techniques for both PCR based assays and hybridization assays are well known in the art (*see*, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor.

One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple breast tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a breast tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a breast tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a breast tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a breast tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

Example 1

ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES

This Example describes the isolation of breast tumor polypeptides from a breast tumor cDNA library.

A cDNA subtraction library containing cDNA from breast tumor subtracted with normal breast cDNA was constructed as follows. Total RNA was extracted from primary tissues using Trizol reagent (Gibco BRL Life Technologies, Gaithersburg, MD) as described by the manufacturer. The polyA⁺ RNA was purified using an oligo(dT) cellulose column according to standard protocols. First strand cDNA was synthesized using the primer supplied in a Clontech PCR-Select cDNA Subtraction Kit (Clontech, Palo Alto, CA). The driver DNA consisted of cDNAs from two normal breast tissues with the tester cDNA being from three primary breast tumors. Double-stranded cDNA was synthesized for both tester and driver, and digested with a combination of endonucleases (MluI, MscI, PvuII, Sall and StuI) which recognize six base pairs DNA. This modification increased the average cDNA size dramatically compared with cDNAs generated according to the protocol of Clontech (Palo Alto, CA). The digested tester cDNAs were ligated to two different adaptors and the subtraction was performed according to Clontech's protocol. The subtracted cDNAs were subjected to two rounds of PCR amplification, following the manufacturer's protocol. The resulting PCR products were subcloned into the TA cloning vector, pCRII (Invitrogen, San Diego, CA) and transformed into ElectroMax *E. coli* DH10B cells (Gibco BRL Life, Technologies) by electroporation. DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division (Foster City, CA) Automated Sequencer Model 373A.

Sixty-three distinct cDNA clones were found in the subtracted breast tumor-specific cDNA library. The determined one strand (5' or 3') cDNA sequences for the clones are provided in SEQ ID NO: 1-61, 72 and 73, respectively. Comparison of these cDNA sequences with known sequences in the gene bank using the EMBL and GenBank databases (Release 97) revealed no significant homologies to the sequences provided in SEQ ID NO: 14, 21, 22, 27, 29, 30, 32, 38, 44, 45, 53, 72 and 73. The sequences of SEQ ID NO: 1, 3, 16, 17, 34, 48, 57, 60 and 61 were found to represent known human genes. The sequences of SEQ ID NO: 2, 4, 23, 39 and 50 were found to show some similarity to previously identified non-human genes. The remaining clones (SEQ ID NO: 5-13, 15, 18-20, 24-26, 28, 31, 33, 35-37, 40-43, 46, 47, 49, 51, 52, 54-56, 58 and 59) were found to show at least some degree of homology to previously identified expressed sequence tags (ESTs).

To determine mRNA expression levels of the isolated cDNA clones, cDNA clones from the breast subtraction described above were randomly picked and colony PCR amplified. Their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using microarray technology (Synteni, Palo Alto, CA). Briefly, the PCR amplification products were arrayed onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. Data was analyzed using Synteni provided GEMTOOLS Software. Of the seventeen cDNA clones examined, those of SEQ ID NO: 40, 46, 59 and 73 were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, PBMC, colon, fetal tissue, salivary gland, bone marrow, lung, pancreas, large intestine, spinal cord, adrenal gland, kidney, pancreas, liver, stomach, skeletal muscle, heart, small intestine, skin, brain and human mammary epithelial cells). The clones of SEQ ID NO: 41 and 48 were found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested, with the exception of bone marrow. The clone of SEQ ID NO: 42 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested except bone marrow and spinal cord. The clone of SEQ ID NO: 43 was

found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord, heart and small intestine. The clone of SEQ ID NO: 51 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large intestine. The clone of SEQ ID NO: 54 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of PBMC, stomach and small intestine. The clone of SEQ ID NO: 56 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large and small intestine, human mammary epithelia cells and SCID mouse-passaged breast tumor. The clone of SEQ ID NO: 60 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord and heart. The clone of SEQ ID NO: 61 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of small intestine. The clone of SEQ ID NO: 72 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of colon and salivary gland.

The results of a Northern blot analysis of the clone SYN18C6 (SEQ ID NO: 40) are shown in Fig. 1. A predicted protein sequence encoded by SYN18C6 is provided in SEQ ID NO: 62.

Additional cDNA clones that are over-expressed in breast tumor tissue were isolated from breast cDNA subtraction libraries as follows. Breast subtraction libraries were prepared, as described above, by PCR-based subtraction employing pools of breast tumor cDNA as the tester and pools of either normal breast cDNA or cDNA from other normal tissues as the driver. cDNA clones from breast subtraction were randomly picked and colony PCR amplified and their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using the microarray technology described above. Twenty-four distinct cDNA clones were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, brain, liver, pancreas, lung, salivary gland, stomach, colon, kidney, bone marrow, skeletal muscle, PBMC, heart, small intestine, adrenal gland, spinal cord, large intestine and skin). The determined partial cDNA sequences for these clones are provided in SEQ ID NO: 63-87. Comparison of the sequences of SEQ ID NO: 74-87

with those in the gene bank as described above, revealed homology to previously identified human genes. No significant homologies were found to the sequences of SEQ ID NO: 63-73.

Three DNA isoforms for the clone B726P (partial sequence provided in SEQ ID NO: 71) were isolated as follows. A radioactive probe was synthesized from B726P by excising B726P DNA from a pT7Blue vector (Novagen) by a BamHI/XbaI restriction digest and using the resulting DNA as the template in a single-stranded PCR in the presence of [α -³²P]dCTP. The sequence of the primer employed for this PCR is provided in SEQ ID NO: 177. The resulting radioactive probe was used to probe a directional cDNA library and a random-primed cDNA library made using RNA isolated from breast tumors. Eighty-five clones were identified, excised, purified and sequenced. Of these 85 clones, three were found to each contain a significant open reading frame. The determined cDNA sequence of the isoform B726P-20 is provided in SEQ ID NO: 175, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 176. The determined cDNA sequence of the isoform B726P-74 is provided in SEQ ID NO: 178, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 179. The determined cDNA sequence of the isoform B726P-79 is provided in SEQ ID NO: 180, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 181.

Efforts to obtain a full-length clone of B726P using standard techniques led to the isolation of five additional clones that represent additional 5' sequence of B726P. These clones appear to be alternative splice forms of the same gene. The determined cDNA sequences of these clones are provided in SEQ ID NO: 464-468, with the predicted amino acid sequences encoded by SEQ ID NO: 464-467 being provided in SEQ ID NO: 470-473, respectively. Using standard computer techniques, a 3,681 bp consensus DNA sequence (SEQ ID NO: 463) was created that contains two large open reading frames. The downstream ORF encodes the predicted amino acid sequence of SEQ ID NO: 181. The predicted amino acid sequence encoded by the upstream ORF is provided in SEQ ID NO: 469.

Further isolation of individual clones that are over-expressed in breast tumor tissue was conducted using cDNA subtraction library techniques described above. In particular, a cDNA subtraction library containing cDNA from breast tumors subtracted with five other normal human tissue cDNAs (brain, liver, PBMC, pancreas and normal breast) was utilized in this screening. From the original subtraction, one hundred seventy seven clones were selected to be further characterized by DNA sequencing and microarray analysis. Microarray analysis demonstrated that the sequences in SEQ ID NO: 182-251 were 2 or more fold over-expressed in human breast tumor tissues over normal human tissues. No significant homologies were found for nineteen of these clones, including, SEQ ID NO: 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245 and 246, with the exception of some previously identified expressed sequence tags (ESTs). The remaining clones share some homology to previously identified genes, specifically SEQ ID NO: 181-184, 187-193, 195-198, 200-204, 206, 207, 209, 210, 212, 213, 217, 218, 220, 221, 223-225, 227-231, 233-235, 237-239, 242-244 and 247-251.

Of the seventy clones showing over-expression in breast tumor tissues, fifteen demonstrated particularly good expression levels in breast tumor over normal human tissues. The following eleven clones did not show any significant homology to any known genes. Clone 19463.1 (SEQ ID NO: 185) was over-expressed in the majority of breast tumors and also in the SCID breast tumors tested (refer to Example 2); additionally, over-expression was found in a majority of normal breast tissues. Clone 19483.1 (SEQ ID NO: 216) was over-expressed in a few breast tumors, with no over-expression in any normal tissues tested. Clone 19470.1 (SEQ ID NO: 219) was found to be slightly over-expressed in some breast tumors. Clone 19468.1 (SEQ ID NO: 222) was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19505.1 (SEQ ID NO: 226) was found to be slightly over-expressed in 50% of breast tumors, as well as in SCID tumor tissues, with some degree of over-expression in found in normal breast. Clone 1509.1 (SEQ ID NO: 232) was found to be over-expressed in very few breast tumors, but with a certain degree of over-expression in metastatic breast tumor tissues, as well as no significant over-expression found in normal tissues. Clone 19513.1 (SEQ ID NO: 236) was shown to be slightly over-expressed in few breast

tumors, with no significant over-expression levels found in normal tissues. Clone 19575.1 (SEQ ID NO: 240) showed low level over-expression in some breast tumors and also in normal breast. Clone 19560.1 (SEQ ID NO: 241) was over-expressed in 50% of breast tumors tested, as well as in some normal breast tissues. Clone 19583.1 (SEQ ID NO: 245) was slightly over-expressed in some breast tumors, with very low levels of over-expression found in normal tissues. Clone 19587.1 (SEQ ID NO: 246) showed low level over-expression in some breast tumors and no significant over-expression in normal tissues.

Clone 19520.1 (SEQ ID NO: 233), showing homology to clone 102D24 on chromosome 11q13.31, was found to be over-expressed in breast tumors and in SCID tumors. Clone 19517.1 (SEQ ID NO: 237), showing homology to human PAC 128M19 clone, was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19392.2 (SEQ ID NO: 247), showing homology to human chromosome 17, was shown to be over-expressed in 50% of breast tumors tested. Clone 19399.2 (SEQ ID NO: 250), showing homology to human Xp22 BAC GSHB-184P14, was shown to be slightly over-expressed in a limited number of breast tumors tested.

In subsequent studies, 64 individual clones were isolated from a subtracted cDNA library containing cDNA from a pool of breast tumors subtracted with cDNA from five normal tissues (brain, liver, PBMC, pancreas and normal breast). The subtracted cDNA library was prepared as described above with the following modification. A combination of five six-base cutters (MluI, MscI, PvuII, SalI and StuI) was used to digest the cDNA instead of RsaI. This resulted in an increase in the average insert size from 300 bp to 600 bp. The 64 isolated clones were colony PCR amplified and their mRNA expression levels in breast tumor tissue, normal breast and various other normal tissues were examined by microarray technology as described above. The determined cDNA sequences of 11 clones which were found to be over-expressed in breast tumor tissue are provided in SEQ ID NO: 405-415. Comparison of these sequences to those in the public database, as outlined above, revealed homologies between the sequences of SEQ ID NO: 408, 411, 413 and 414 and previously isolated ESTs. The sequences of SEQ ID NO: 405-407, 409, 410, 412 and 415 were found to show some homology to previously identified sequences.

In further studies, a subtracted cDNA library was prepared from cDNA from metastatic breast tumors subtracted with a pool of cDNA from five normal tissues (breast, brain, lung, pancreas and PBMC) using the PCR-subtraction protocol of Clontech, described above. The determined cDNA sequences of 90 clones isolated from this library are provided in SEQ ID NO: 315-404. Comparison of these sequences with those in the public database, as described above, revealed no significant homologies to the sequence of SEQ ID NO: 366. The sequences of SEQ ID NO: 320-324, 342, 353, 367, 368, 377, 382, 385, 389, 395, 397 and 400 were found to show some homology to previously isolated ESTs. The remaining sequences were found to show homology to previously identified gene sequences.

In yet further studies, a subtracted cDNA library (referred to as 2BT) was prepared from cDNA from breast tumors subtracted with a pool of cDNA from six normal tissues (liver, brain, stomach, small intestine, kidney and heart) using the PCR-subtraction protocol of Clontech, described above. cDNA clones isolated from this subtraction were subjected to DNA microarray analysis as described above and the resulting data subjected to four modified Gemtools analyses. The first analysis compared 28 breast tumors with 28 non-breast normal tissues. A mean over-expression of at least 2.1 fold was used as a selection cut-off. The second analysis compared 6 metastatic breast tumors with 29 non-breast normal tissues. A mean over-expression of at least 2.5 fold was used as a cut-off. The third and fourth analyses compared 2 early SCID mouse-passaged with 2 late SCID mouse-passaged tumors. A mean over-expression in the early or late passaged tumors of 2.0 fold or greater was used as a cut-off. In addition, a visual analysis was performed on the microarray data for the 2BT clones. The determined cDNA sequences of 13 clones identified in the visual analysis are provided in SEQ ID NO: 427-439. The determined cDNA sequences of 22 clones identified using the modified Gemtools analysis are provided in SEQ ID NO: 440-462, wherein SEQ ID NO: 453 and 454 represent two partial, non-overlapping, sequences of the same clone.

Comparison of the clone sequences of SEQ ID NO: 436 and 437 (referred to as 263G6 and 262B2) with those in the public databases, as described above, revealed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 427, 429, 431, 435, 438, 441, 443, 444, 445, 446, 450, 453 and 454 (referred to as

266B4, 266G3, 264B4, 263G1, 262B6, 2BT2-34, 2BT1-77, 2BT1-62, 2BT1-60,61, 2BT1-59, 2BT1-52 and 2BT1-40, respectively) showed some homology to previously isolated expressed sequences tags (ESTs). The sequences of SEQ ID NO: 428, 430, 432, 433, 434, 439, 440, 442, 447, 448, 449, 451, 452 and 455-462 (referred to as clones 22892, 22890, 22883, 22882, 22880, 22869, 21374, 21349, 21093, 21091, 21089, 21085, 21084, 21063, 21062, 21060, 21053, 21050, 21036, 21037 and 21048, respectively), showed some homology to gene sequences previously identified in humans.

Example 2

ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES OBTAINED BY PCR-BASED SUBTRACTION USING SCID-PASSAGED TUMOR RNA

Human breast tumor antigens were obtained by PCR-based subtraction using SCID mouse passaged breast tumor RNA as follows. Human breast tumor was implanted in SCID mice and harvested on the first or sixth serial passage, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. _____. Genes found to be differentially expressed between early and late passage SCID tumor may be stage specific and therefore useful in therapeutic and diagnostic applications. Total RNA was prepared from snap frozen SCID passaged human breast tumor from both the first and sixth passage.

PCR-based subtraction was performed essentially as described above. In the first subtraction (referred to as T9), RNA from first passage tumor was subtracted from sixth passage tumor RNA to identify more aggressive, later passage-specific antigens. Of the 64 clones isolated and sequenced from this subtraction, no significant homologies were found to 30 of these clones, hereinafter referred to as: 13053, 13057, 13059, 13065, 13067, 13068, 13071-13073, 13075, 13078, 13079, 13081, 13082, 13092, 13097, 13101, 13102, 13131, 13133, 13119, 13135, 13139, 13140, 13146-13149, and 13151, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 88-116,

respectively. The isolated cDNA sequences of SEQ ID NO: 117-140 showed homology to known genes.

In a second PCR-based subtraction, RNA from sixth passage tumor was subtracted from first passage tumor RNA to identify antigens down-regulated over multiple passages. Of the 36 clones isolated and sequenced, no significant homologies were found to nineteen of these clones, hereinafter referred to as: 14376, 14377, 14383, 14384, 14387, 14392, 14394, 14398, 14401, 14402, 14405, 14409, 14412, 14414-14416, 14419, 14426, and 14427, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 141-159, respectively. The isolated cDNA sequences of SEQ ID NO: 160-174 were found to show homology to previously known genes.

Further analysis of human breast tumor antigens through PCR-based subtraction using first and sixth passage SCID tumor RNA was performed. Sixty three clones were found to be differentially expressed by a two or more fold margin, as determined by microarray analysis, i.e., higher expression in early passage tumor over late passage tumor, or vice versa.. Seventeen of these clones showed no significant homology to any known genes, although some degree of homology with previously identified expressed sequence tags (ESTs) was found, hereinafter referred to as 20266, 20270, 20274, 20276, 20277, 20280, 20281, 20294, 20303, 20310, 20336, 20341, 20941, 20954, 20961, 20965 and 20975 (SEQ ID NO: 252-268, respectively). The remaining clones were found to share some degree of homology to known genes, which are identified in the Brief Description of the Drawings and Sequence Identifiers section above, hereinafter referred to as 20261, 20262, 20265, 20267, 20268, 20271, 20272, 20273, 20278, 20279, 20293, 20300, 20305, 20306, 20307, 20313, 20317, 20318, 20320, 20321, 20322, 20326, 20333, 20335, 20337, 20338, 20340, 20938, 20939, 20940, 20942, 20943, 20944, 20946, 20947, 20948, 20949, 20950, 20951, 20952, 20957, 20959, 20966, 20976, 20977 and 20978. The determined cDNA sequences for these clones are provided in SEQ ID NO: 269-313, respectively.

The clones 20310, 20281, 20262, 20280, 20303, 20336, 20270, 20341, 20326 and 20977 (also referred to as B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P, respectively) were selected for further analysis based

on the results obtained with microarray analysis. Specifically, microarray data analysis indicated at least two- to three-fold overexpression of these clones in breast tumor RNA compared to normal tissues tested. Subsequent studies led to the determination of the complete insert sequence for the clones B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P. These extended cDNA sequences are provided in SEQ ID NO: 416-426, respectively.

Example 3

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on an Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention.

Claims

1. An isolated polypeptide comprising at least an immunogenic portion of a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468;

(b) sequences that hybridize to a sequence of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 176, 179, 181 and 469-473.

4. An isolated polynucleotide encoding at least 15 contiguous amino acid residues of a breast tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

7. An isolated polynucleotide comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219,

222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector comprising a polynucleotide according to any one of claims claim 4-7.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An expression vector comprising a polynucleotide according claim 8.

12. A host cell transformed or transfected with an expression vector according to claim 11.

13. A pharmaceutical composition comprising a polypeptide according to claim 1, in combination with a physiologically acceptable carrier.

14. A vaccine comprising a polypeptide according to claim 1, in combination with an immunostimulant.

15. A vaccine according to claim 14, wherein the immunostimulant is an adjuvant.

16. A vaccine according to claim 14, wherein the immunostimulant induces a predominantly Type I response.

17. A pharmaceutical composition comprising a polynucleotide according to claim 4, in combination with a physiologically acceptable carrier.
18. A vaccine comprising a polynucleotide according to claim 4, in combination with an immunostimulant.
19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.
20. A vaccine according to claim 18, wherein the immunostimulant induces a predominantly Type I response.
21. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a breast tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.
22. A pharmaceutical composition comprising an antibody or fragment thereof according to claim 18, in combination with a physiologically acceptable carrier.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

30. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polynucleotide according to claim 4, and thereby inhibiting the development of a cancer in the patient.

31. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antibody or antigen-binding fragment thereof according to claim 21, and thereby inhibiting the development

of a cancer in the patient.

32. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

33. A method according to claim 32, wherein the antigen-presenting cell is a dendritic cell.

34. A method according to any one of claims 29-32, wherein the cancer is breast cancer .

35. A fusion protein comprising at least one polypeptide according to claim 1.

36. A fusion protein according to claim 35, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

37. A fusion protein according to claim 35, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

38. A fusion protein according to claim 35, wherein the fusion protein comprises an affinity tag.

39. An isolated polynucleotide encoding a fusion protein according to claim 35.

40. A pharmaceutical composition comprising a fusion protein according to claim 32, in combination with a physiologically acceptable carrier.

41. A vaccine comprising a fusion protein according to claim 35, in combination with an immunostimulant.

42. A vaccine according to claim 41, wherein the immunostimulant is an adjuvant.

43. A vaccine according to claim 41, wherein the immunostimulant induces a predominantly Type I response.

44. A pharmaceutical composition comprising a polynucleotide according to claim 40, in combination with a physiologically acceptable carrier.

45. A vaccine comprising a polynucleotide according to claim 40, in combination with an immunostimulant.

46. A vaccine according to claim 45, wherein the immunostimulant is an adjuvant.

47. A vaccine according to claim 45, wherein the immunostimulant induces a predominantly Type I response.

48. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 40 or claim 44.

49. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 41 or claim 45.

50. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

51. A method according to claim 50, wherein the biological sample is blood or a fraction thereof.

52. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

53. A method for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of:

(i) a polypeptide according to claim 1;

(ii) a polynucleotide encoding such a polypeptide; and/or

(iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

54. An isolated T cell population, comprising T cells prepared according to the method of claim 53.

55. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 54.

56. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a polypeptide;

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

57. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a polypeptide;

such that T cells proliferate;

(b) cloning at least one proliferated cell; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

58. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

59. A method according to claim 58, wherein the binding agent is an antibody.

60. A method according to claim 59, wherein the antibody is a monoclonal antibody.

61. A method according to claim 58, wherein the cancer is breast cancer.

62. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from

the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

63. A method according to claim 62, wherein the binding agent is an antibody.

64. A method according to claim 63, wherein the antibody is a monoclonal antibody.

65. A method according to claim 62, wherein the cancer is a breast cancer.

66. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

67. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

68. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

69. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

70. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

71. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

72. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 21; and
- (b) a detection reagent comprising a reporter group.

73. A kit according to claim 72, wherein the antibodies are immobilized on a solid support.

74. A kit according to claim 73, wherein the solid support comprises nitrocellulose, latex or a plastic material.

75. A kit according to claim 72, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

76. A kit according to claim 72, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

77. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotides.

78. A oligonucleotide according to claim 77, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

79. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 77; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

SEQUENCE LISTING

<110> Corixa Corporation
 Yuqui, Jiang
 Dillon, Davin C.
 Mitcham, Jennifer L.
 Xu, Jiangchun
 Harlocker, Susan L.

<120> COMPOSITIONS FOR THE TREATMENT AND
 DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

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tcagactcta	gaactgtggc	ccgtttccgc	cgtctgcct	ccacctgcat	ctgcatagac	300
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<210> 27

<211> 301

<212> DNA

<213> Homo sapien

<400> 27

aaatcagtc	tcacatctgt	gaaaagagtg	ctagttataa	caaatgagat	cacaaatttg	60
accattttat	tagacaccct	ctattagtgt	taacagacaa	agatgaagg	taagttgaaa	120
tcaaattgaa	atcatcttcc	ctctgtacag	attgcaatat	ctgataatac	cctcaacttt	180
cttgggtgaa	attaattgcc	tggtagctac	agtccagtg	taacaggcaa	taatgggtgt	240
attccagagg	agaggactag	gtggcaggaa	aataaatgag	attagcagta	tttgacttgg	300
a						301

<210> 28

<211> 286

<212> DNA

<213> Homo sapien

<400> 28

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atccttagag	gaagagaggg	gtaagggtgat	aaagtaactg	aaggaccgca	agacgggtat	120
gtcccttggt	caccaaattg	tcaaagggtc	aaagatcgga	ggaggtcagg	gggtaacgca	180
ggaacagggt	agggcggttc	gccctctctc	cctctcccc	tttcaacctc	ttaatcactg	240
gctaactcgc	gacctcatgg	gttaattcgt	aagcttacac	gcgttg		286

<210> 29

<211> 301

<212> DNA

<213> Homo sapien

<400> 29

gtcatgttct	tgtcttctct	tctttacaca	tttgagttgt	gccttctggt	cttaaagaga	60
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ttttcctttg	ttcaaaggat	ttattcctac	catttcacaa	atccgaaaat	aattgaggaa	120
acagggtaca	tcattccaat	tttgcttgg	gtttgaagag	tctctcatgg	tggcacagtc	180
ctccagggtg	gctatgtgt	tgggctcccc	tacatcccag	aagctcagag	actttgtcaa	240
aggtgtgccg	tccaccatt	gccactgacc	ctcgacaacc	tggtctgaca	gtccaataaa	300
a						301

<210> 30

<211> 332

<212> DNA

<213> Homo sapien

<400> 30

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cacctagtc	tctcctctgg	aatcacacca	ttattgcctg	ttaacactgg	actgtgagta	120
ccaggcaatt	aatttgcacc	aagaaagttg	agggtattat	cagatattgc	aatctgtaca	180
gaggggaagat	gatttcaatt	tgatttcaac	ttaaccttca	tctttgtctg	ttaacactaa	240
tagaggggtgt	ctaataaaaat	ggtcaaattt	gtgatctcat	ttgttataac	tagcactctt	300
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<210> 31

<211> 141

<212> DNA

<213> Homo sapien

<400> 31

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tttcatttgc	aggggttcag	ggaggggttc	aggggttcag	ggaggggtct	tgccccacaa	120
ccgggggaag	ggagagggca	c				141

<210> 32

<211> 201

<212> DNA

<213> Homo sapien

<400> 32

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aatctgtcat	ctaccttaaa	gagagaaaaa	agatggaaca	tagggcccacc	tagtttcac	120
catccaccta	cataaccaac	atagatgtga	ggtccactgc	actgatagcc	agactgcctg	180
gggtaaacct	tttcagggag	g				201

<210> 33

<211> 181

<212> DNA

<213> Homo sapien

<400> 33

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gactaaactt	caagtcacag	acttttatgt	gacagattgg	agcaggggtt	gttatgcatg	120
tagagaaccc	aaactaattt	attaaacagg	atagaaacag	gctgtctggg	tgaaatgggt	180
c						181

<210> 34

<211> 151

<212> DNA

<213> Homo sapien

<400> 34
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 acttttcagt cgagggcctg atgaatcttg g 151

<210> 35
 <211> 291
 <212> DNA
 <213> Homo sapien

<400> 35
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 agctttaaca cgtgtaatct gcagtcctta acagtggcgt aattgtacgt acctgttggt 120
 ttccagtttg tttttcacct ataatgaatt gtaaaaacaa acatacttgt ggggtctgat 180
 agcaaacata gaaatgatgt atattgtttt ttgttatcta tttattttca tcaatacagt 240
 attttgatgt attgcaaaaa tagataataa tttatataac aggttttctg t 291

<210> 36
 <211> 201
 <212> DNA
 <213> Homo sapien

<400> 36
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 aaattttgtt tacatgaata tggaataaat acaataatca aaatatgact ctccctaaaa 120
 gtgaaacaca caagccaatc cggaactgct gtgcgaaaga taaaatcgag aaaggcaagg 180
 tttcggtagg aggacgcgat g 201

<210> 37
 <211> 121
 <212> DNA
 <213> Homo sapien

<400> 37
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 cgtattacaa ttcactggcc gtcgttttac aacgtcgtga ctgggaaac cctggcggtta 120
 c 121

<210> 38
 <211> 200
 <212> DNA
 <213> Homo sapien

<400> 38
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 gataacacca cacatagaac attataatta cacacaaatt tatggtaaaa gaattaatat 180
 gctgtctggt gctgctgta 200

<210> 39
 <211> 760
 <212> DNA
 <213> Homo sapien

<400> 39

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gatctgaaaa	tacttgaggt	tattacatac	tagattagct	tctaattgga	accatttttc	120
ttttaacagt	gatcaaat	ttatttcgaa	gttaatcggt	cccttggtgg	ctgcatacac	180
atcgcatata	caaacatact	gttgatattt	ttcccagttt	tggttggtga	tgccaccaca	240
gtcatcccca	gggtctatac	atactatgtt	tcaactgtat	tatttgccat	ttttggcatt	300
agaatgcttc	gggaaggctt	aaagatgagc	cctgatgagg	gtcaagagga	actggaagaa	360
gttcaagctg	aattaaagaa	gaaagatgaa	gaagtaagcc	atggcactgt	tgatctggac	420
caaaaaggca	ctcaactagg	aataaacact	ctacagaggt	ttctcagtgg	ccccatctgt	480
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tgaacacagg	taatcagttt	ccttaattag	gttgattata	agctcctgaa	aagcaggaac	660
tgtattttat	aattttacct	gtttctcccg	tggtgtctag	gatagtaagt	gagcagagca	720
gtaataactg	tttgggtttg	tcagacctgc	ccgggcggcc			760

<210> 40

<211> 452

<212> DNA

<213> Homo sapien

<400> 40

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ggtttatcgt	gacttttcct	tcttggttac	ttttcgctag	gaaggggagt	tgtaggggca	180
gattcaggta	ttggaatagg	aaaattacgt	ctaaaccatg	gaaatcttgg	aaatggaatt	240
ggtggaagtg	ggcgaaatgg	atatgggtaa	gggaacacaa	aaaaccctga	agctaattca	300
tcgctgtcac	tgatacttct	tttttctcgt	tcctgggtctt	gagagactgg	gaaaccaaca	360
gccactgcca	agatggctgt	gatcaggagg	agaactttct	tcctctcaaa	cgtttcagtc	420
agttctttct	ctcacctcgg	ccgcgaccac	gc			452

<210> 41

<211> 676

<212> DNA

<213> Homo sapien

<400> 41

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aagatacata	gcaatgatag	caggtttctt	tttaaagctt	agtattaata	ttaaatattt	120
ttccccattt	aaattttaca	ttacttgcca	agaaaaaaaa	aaaattaaaa	ctcaagttac	180
ttgaagcctg	gacacacttc	catgattagc	cgggctaggt	aaaagttggt	ggctttattc	240
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ttgaaaagtg	tgctacaaaa	atggatggcc	tggtataagc	caggatacaa	agttaaggat	360
gggggtaagg	gagggacatt	ttcttccaga	agaaaagaca	gaattttctga	agagtcccag	420
tccataattt	tcccaaaatg	gttggaggag	agggtaaaat	ctcaacatga	gtttcaaagt	480
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gccccatccc	cagctaggag	aatggaaatg	gaaactttta	ttgcccagtg	ggtgtgaaag	600
tgggctgaag	cttgggttgg	actgaattct	ctaagaggtt	tcttctagaa	acagacaact	660
cagacctgcc	cggggcg					676

<210> 42

<211> 468

<212> DNA

<213> Homo sapien

<400> 42

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ctgagcctca	gtctccctcc	cttggggcct	atgcagaggt	ccacaacaca	cagatttgag	120
ctcagccctg	gtgggcagag	aggtagggat	ggggctgtgg	ggatagttag	gcacgcgaat	180
gtaagactcg	ggattagtac	acacttggtg	attaatggaa	atgtttacag	atccccaaagc	240
ctggcaaggg	aatttcttca	actccctgcc	ccccagccct	ccttatcaaa	ggacaccatt	300
ttggcaagct	ctatgaccaa	ggagccaaac	atcctacaag	acacagttag	cataactaatt	360
aaaacccctt	gcaaagccca	gcttgaaacc	ttcacttagg	aacgtaatcg	tgtcccttat	420
cctacttccc	cttcctaatt	ccacagacct	gcccggggcg	ccgctcga		468

<210> 43

<211> 408

<212> DNA

<213> Homo sapien

<400> 43

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ttcatttcag	gagagcagca	gttaaaccgg	tggattttgt	agttagggaac	ctgggttcaa	120
acctctttcc	actaattggc	tatgtctctg	gacagttttt	tttttttttt	tttttttttaa	180
accttttctg	aacttttact	ttctatggct	acctcaaaga	attgttgtga	ggcttgagat	240
aatgcatttg	taaagggctt	gccagatagg	aagatgctag	ttatggattt	acaagggttg	300
taaggctgta	agagtctaaa	acctacagtg	aatcacaaatg	catttaccct	cactgacttg	360
gacataagtg	aaaactagcc	cgaagtctct	ttttcaaatt	acttacag		408

<210> 44

<211> 160

<212> DNA

<213> Homo sapien

<400> 44

tggtcgcgcc	cgaggtcttg	tgtgccctgt	ggccagggg	accaagaaca	acaagatcca	60
ctctctgtgc	tacaatgatt	gcaccttctc	acgcaacact	ccaaccagga	ctttcaacta	120
caacttctcc	gctttggcaa	acaccgtcac	tcttgctgga			160

<210> 45

<211> 231

<212> DNA

<213> Homo sapien

<400> 45

cgagcgcccg	cccgggcagg	tctggggagg	tgattccatc	cagagtcata	tctgttgta	60
ccccataaag	tcgatcagca	aggctgacag	gctgtgagga	aaccccgcc	ttgtagcctg	120
tcacctctgg	ggggatgatg	actgcctggc	agacgtaggc	tgtgatagat	ttgggagaaa	180
acctgactca	ccctcaggaa	tccggagggtc	ggtgacattg	tcggtgcaca	c	231

<210> 46

<211> 371

<212> DNA

<213> Homo sapien

<400> 46

cccgggcagg	tctgtgtaac	atgccaaaggc	tttgcacttt	ctgcagagca	gttttttatt	60
ttccttatca	ggtacaggtt	ttggtttttc	ttgactatct	ctgatgaatt	tttcatgagt	120
ctgtatatgc	agaatctttt	ccctaaatac	tgcttcgtcc	catgtctgaa	ggcgtaaaat	180
aaagtcattc	atcatttttt	ctttgtacat	gtttatttgt	tctttttcaa	ttacaccaag	240
cattactagt	cagaaggaag	cacttgctac	ctcttgctct	tcctctgcct	ctgggttgga	300

tcattttgat gacattgccc acattactca tgaaggatga caagattgca ctgtgcaatg 360
tcaattgcct t 371

<210> 47
<211> 261
<212> DNA
<213> Homo sapien

<400> 47
gccctgtttt tatacacttc acatttgcag aaatataatg atgccctcat tatcagtgag 60
catgcacgaa tgaaagatgc tctggattac ttgaaagact tcttcagcaa tgtccgagca 120
gcaggattcg atgagattga gcaagatctt actcagagat ttgaagaaaa gctgcaggaa 180
ctagaaagtg tttccaggga tcccagcaat gagaatccta aacttgaaga cctctgcttc 240
atcttacaag aagagtacca c 261

<210> 48
<211> 701
<212> DNA
<213> Homo sapien

<400> 48
cgagcggcccc ccgggcaggt ccaattagta caagtctcat gatataatca ctgcctgcat 60
acatatgcac agatccagtt agtgagtttg tcaagcttaa tctaattggt taagtctcaa 120
agagattatt attcttgatg tttgctttgt attggctaac aaatgtgcag aggtaataca 180
tatgtgatgt ccgatgtctc tgtctttttt tttgtcttta aaaaataatt ggcagcaact 240
gtatttgaat aaaatgattt cttagtatga ttgtaccgta atgaatgaaa gtggaacatg 300
tttctttttg aaagggagag aattgaccat ttattattgt gatgtttaag ttataactta 360
ttgagcactt ttagtagtga taactgtttt taaacttgcc taataccttt cttgggtatt 420
gttttgaatg tgacttattt aacccccctt tttgtttgtt taagttgctg ctttaggtta 480
acagcgtgtt ttagaagatt taaatttttt tctgtctgac acaattagtt attcagagca 540
agagggcctg attttataga agccccctga aaagagggtc agatgagagc agagatacac 600
tgagaaatta tgtgatctgt gtgttggtggg aagagaattt tcaatatgta actacggagc 660
tgtagtgcc a ttagaactg tgaatttcca aataaatttg a 701

<210> 49
<211> 270
<212> DNA
<213> Homo sapien

<400> 49
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tatggaaaata gatatttgtg cagctcaatt tatgcagaga ttaaatgaca tcataatact 180
ggatgaaaac ttgcatagaa ttctgattaa atagtgggtc tgtttcacat gtgcagtttg 240
aagtatttaa attaacact cctttcacag 270

<210> 50
<211> 271
<212> DNA
<213> Homo sapien

<400> 50
atgcatttat ccatatgaac ttgattattc tgaattactg actataaaaa ggctattgtg 60
aaagatatca cactttgaaa cagcaaatga attttcaatt ttacatttaa ttataagacc 120
acaataaaaa gttgaacatg cgcataatcta tgcatttcac agaagattag taaaactgat 180

ggcaacttca gaattatttc atgaagggtta caaacagtct ttaccacaat tttcccatgg 240
tcttatecctt caaaaataaaa ttccacacac t 271

<210> 51
<211> 241
<212> DNA
<213> Homo sapien

<400> 51
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aatggcttat cccacacgcc atgtaagtta ccatgcctgt ctctccctc ctacacattt 120
ccagctcctg ctgcagttat tctacagaa gctgccattt accagccctc tgtgattttg 180
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t 241

<210> 52
<211> 271
<212> DNA
<213> Homo sapien

<400> 52
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tgcatgctgc ttgctgtaag ttacgatttg gcttcactag ctcaaatttt ttcactccac 180
caaaagataa ggcacaggcc cgtttgtcca atcaagtttg ctgaaaatac tgcagcctga 240
gtgtagacaa acttcccctg aatttgctag a 271

<210> 53
<211> 493
<212> DNA
<213> Homo sapien

<400> 53
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caatgagaaa atatgattta atggagtcgt tcaataacct cacaatctcg ctgttccgag 180
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cctcaagggc gaattctgca gatatccatc acactggcgg ccgctcgagc atgcatctag 480
agggcccaat tgc 493

<210> 54
<211> 321
<212> DNA
<213> Homo sapien

<400> 54
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actgaatgtc aataaactct gtgattttgt taggaagtaa aactgggatc tatttagcca 120
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gactttctct ctggagatac ctttttgaat atacaatggc cttggctcac taggtttaaa 240
tacaacaag tctgaaaccc actgaagact gagagattgc agcaatattc tctgaattag 300
gatcggggttc cataactcta a 321

<210> 55
 <211> 281
 <212> DNA
 <213> Homo sapien

<400> 55
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 gaacagccca ccttgggttac agctagcaaa gatgggtact tcaaagtatg gatattaaca 180
 gatgactctg acatatacaa aaaagctgtt ggctggacct gtgactttgt tggtagttat 240
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<210> 56
 <211> 612
 <212> DNA
 <213> Homo sapien

<400> 56
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 gggcggccgt cg 612

<210> 57
 <211> 363
 <212> DNA
 <213> Homo sapien

<400> 57
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 acccaagaga gttgtgggag acaagatcac agctatgagc acctgcacg gtgtccagga 180
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 aagtgaatac atctgactgt gtcacctcc aacctccagc gtggatgtcc ctgtctgggc 300
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 cga 363

<210> 58
 <211> 750
 <212> DNA
 <213> Homo sapien

<400> 58
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 gtggcccttc ttcaggaaaag agcaaataag ttggtccaag tacttgatgc ttaaggaata 180
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actgaaagaa	attgacaaaag	aagaacacct	gtatatcttc	atcagtaccc	ccgagtcctt	360
ggctggcata	ctgggaacga	ccaaagacac	acccaagctc	ggctctcttc	tggtgattct	420
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ccccggagta	tgagttcctc	tggggcctcc	gtccctacca	tgagactagc	aagatgaaaa	660
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<210> 59

<211> 505

<212> DNA

<213> Homo sapien

<400> 59

tggccgcccc	ggcaggtcca	gtctacaagc	agagcactct	catggggagc	accagatgag	60
ttccagccgc	agttctttta	taagctttaa	gtgcctcatg	aagacgcgag	gatctcttcc	120
aagtgcacc	tggtcacatc	agggcacatt	cagcagcaga	agtctgtttc	cagtatagtc	180
cttggtagtg	ctaaattcca	ctgtcccttt	ctcagcagtc	aataatccat	gataaattct	240
gtacaacact	gtagtcaata	acagcagcac	cagacagcat	attaattctt	ttaccataaa	300
tttgtgtgta	attataatgt	tctatgtgtg	gtgttatcaa	agaatcact	gtgtctctaa	360
atatcatata	tgtatgtctg	gataaatata	ttgctgtaca	acatctccaa	catgcaggtc	420
atgctctaag	acttggggat	atagagtaat	acatgtttcg	tggacctcgg	ccgcgaccac	480
gctaagggcg	aattctgcag	atatac				505

<210> 60

<211> 520

<212> DNA

<213> Homo sapien

<400> 60

cgtggctcgc	gccgaggtcc	tcaggacaag	gaaacaggta	tcagcatgat	ggtagcagaa	60
accttatcac	caaggtgcag	gagctgactt	cttccaaaga	gttgtgggtc	cgggcagcgg	120
tcattgtcgt	cccttgcctg	agggctgatt	ttagtgttgc	ttattatggt	ggccctgagg	180
atgcttcgaa	gtgaaaataa	gaggctgcag	gatcagcggc	aacagatgct	ctcccgtttg	240
cactacagct	ttcacggaca	ccattccaaa	aaggggcagg	ttgcaaagtt	agacttgga	300
tgcatgggtc	cggctcagtg	gcacgagaac	tgctgtctga	cctgtgataa	aatgagacaa	360
gcagacctca	gcaacgataa	gatcctctcg	cttgttccact	ggggcatgta	cagtgggcac	420
gggaagctgg	aattcgtatg	acggagtctt	atctgaacta	cacttactga	acagcttgaa	480
ggacctgccc	gggcggccgc	tcgaaagggg	cgaattctgc			520

<210> 61

<211> 447

<212> DNA

<213> Homo sapien

<400> 61

agagaggtgt	ttttattctt	tggggacaaa	gccgggttct	gtgggtgtag	gattctccag	60
gttctccagg	ctgtagggcc	cagaggctta	atcagaattt	tcagacaaaa	ctggaacctt	120
tcttttttcc	cgttggttta	ttttagtcc	ttgggcaaac	caatgtcttt	gttcgaaaga	180
gggaaaataa	tccaaactgt	tttcttttaa	cttttttttt	aggttcaggg	gcacatgtgt	240
aggcttgcta	tataggtaaa	ttgcatgtca	ccagggtttg	ttgtacagat	tatttcacat	300
tccagataaa	aagcatagta	ccagataggt	agttttttga	tcctcacctt	ccttccatgc	360
tccgacctca	ggtaggcccc	agtgtctgac	ctgcccggcg	gcccgcctga	aagggccaat	420

tctgcagata tccatcacac tggccgg

447

<210> 62
 <211> 83
 <212> PRT
 <213> Homo sapien

<400> 62
 Lys Lys Val Leu Leu Leu Ile Thr Ala Ile Leu Ala Val Ala Val Gly
 1 5 10 15
 Phe Pro Val Ser Gln Asp Gln Glu Arg Glu Lys Arg Ser Ile Ser Asp
 20 25 30
 Ser Asp Glu Leu Ala Ser Gly Phe Phe Val Phe Pro Tyr Pro Tyr Pro
 35 40 45
 Phe Arg Pro Leu Pro Pro Ile Pro Phe Pro Arg Phe Pro Trp Phe Arg
 50 55 60
 Arg Asn Phe Pro Ile Pro Ile Pro Ser Ala Pro Thr Thr Pro Leu Pro
 65 70 75 80
 Ser Glu Lys

<210> 63
 <211> 683
 <212> DNA
 <213> Homo sapien

<400> 63
 acaaagattg gtagctttta ttttttttta aaaatgctat actaagagaa aaaacaaaag 60
 accacaacaa tattccaaat tatagggtga gagaatgtga cratgaagaa agtattctaa 120
 ccaactaaaa aaaatattga aaccactttt gattgaagca aaatgaataa tgctagattt 180
 aaaaacagtg tgaaatcaca ctttggtctg taaacatatt tagctttgct ttccattcag 240
 atgtatacat aaacttattt aaaatgtcat ttaagtgaac cattccaagg cataataaaa 300
 aaagwggtag caaatgaaaa ttaaagcatt tttttggta gttcttcaat aatgatrcga 360
 gaaactgaat tccatccagt agaagcatct ccttttgggt aatctgaaca agtrccaacc 420
 cagatagcaa catccactaa tccagcacca attccttcac aaagtccttc cacagaagaa 480
 gtgcgatgaa tattaattgt tgaattcatt tcagggtctt cttggtccaa ataaattata 540
 gcttcaatgg gaagaggtcc tgaacattca gctccattga atgtgaaata ccaacgctga 600
 cagcatgcat ttctgcattt tagccgaagt gagccactga acaaaaactct tagagcacta 660
 tttgaacgca tctttgtaaa tgt 683

<210> 64
 <211> 749
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(749)
 <223> n = A,T,C or G

<400> 64
 ctgttcattt gtccgccagc tcttggaactg gatgtgtgaa aggcatacaca ttccatttt 60
 cctccgtgta aatgttttat gtgttcgctt actgatccca ttctgtgctt ctattgtaaa 120
 tatttgcatt ttgtatttat tatctctgtg ttttccccct aaggcataaa atggtttact 180
 gtgttcattt gaaccattt actgatctct gttgtatatt ttccatgcca ctgctttgtt 240

ttctcctcag	aagtcgggta	gatagcattt	ctatcccatc	cctcacgtta	ttggaagcat	300
gcaacagtat	ttattgctca	gggtcttctg	cttaaaactg	aggaagggtcc	acattcctgc	360
aagcattgat	tgagacattt	gcacaatcta	aaatgtaagc	aaagtaagtc	attaaaaata	420
caccctctac	ttgggcttta	tactgcatac	aaatttactc	atgagccttc	ctttgaggaa	480
ggatgtggat	ctccaaataa	agatttagtg	tttattttga	gctctgcatc	ttancaagat	540
gatctgaaca	cctctccttt	gtatcaataa	atagccctgt	tattctgaag	tgagaggacc	600
aagtatagta	aaatgctgac	atctaaaact	aaataaatag	aaaacaccag	gccagaacta	660
tagtcatact	cacacaaaagg	gagaaattta	aactcgaacc	aagcaaaagg	cttcacggaa	720
atagcatgga	aaaacaatgc	ttccagtgg				749

<210> 65

<211> 612

<212> DNA

<213> Homo sapien

<400> 65

acagcagcag	tagatggctg	caacaacctt	cctcctaccc	cagcccagaa	aatattttctg	60
ccccacccca	ggatccggga	ccaaaataaa	gagcaagcag	gcccccttca	ctgagggtgct	120
gggtagggct	cagtgccaca	ttactgtgct	ttgagaaaga	ggaaggggat	ttgtttggca	180
ctttaaaaat	agaggagtaa	gcaggactgg	agaggccaga	gaagatacca	aaattggcag	240
ggagagacca	tttggcgcca	gtccccctagg	agatgggagg	agggagatag	gtatgagggt	300
agggcgctaag	aagagtagga	gggggtccact	ccaagtggca	gggtgctgaa	atgggctagg	360
accaacagga	cactgactct	aggtttatga	cctgtccata	cccgttccac	agcagctggg	420
tgggagaaat	caccattttg	tgactttctaa	taaaataatg	ggtctaggca	acagttttca	480
atggatgcta	aaacgattag	gtgaaaagtt	gatggagaat	tttaattcag	gggaattagg	540
ctgataccat	ctgaaacccat	ttggcatcat	taaaatgtg	acaacctggt	ggctgccagg	600
gaggaagggg	ag					612

<210> 66

<211> 703

<212> DNA

<213> Homo sapien

<400> 66

tagcgtggctc	gcgcccgagg	tacattgatg	ggctggagag	caggggttggc	agcctgttct	60
gcacagaacc	aagaattaca	gaaaaaagtc	caggagctgg	agaggcacia	catctccttg	120
gtagctcagc	tccgccagct	gcagacgcta	attgctcaaa	cttccaacaa	agctgcccag	180
accagcactt	gtgttttgat	tcttcttttt	tccttggtct	tcatcatcct	gcccagcttc	240
agtccattcc	agagtcgacc	agaagctggg	tctgaggatt	accagcctca	cggagtgact	300
tccagaaata	tcctgaccca	caaggacgta	acagaaaatc	tggagaccca	agtggtagag	360
tccagactga	gggagccacc	tggagccaag	gatgcaaatg	gctcaacaag	gacactgctt	420
gagaagatgg	gaggggaagcc	aagacccagt	gggcgcaccc	ggtcctgtgt	gcatgcagat	480
gagatgtgag	ctggaacaga	ccttcctggc	ccacttcctg	atcacaagga	atcctgggct	540
tccttatggc	tttgcttccc	actgggattc	ctacttaggt	gtctgcccct	aggggtccaa	600
atcacttcag	gacaccccaa	gagatgtcct	ttagtctctg	cctgaggcct	agtctgcatt	660
tgtttgcata	tatgagaggg	tacctgcccc	ggcgcccgct	cga		703

<210> 67

<211> 1022

<212> DNA

<213> Homo sapien

<400> 67

cttgagaaag	caggattgtt	ttaagttcca	agatttaaca	aacttactgt	tcagcatcat	60
attcaagcct	aaaaggaaga	taggattttc	aagatatatt	tccaacttct	ttaacatggc	120

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accatggatg aactgtttct cagcactgtg ctgcttcact tggaattaag gatgaattgg 180
gaggagacag tatgacatag gtgggtaggt tgggtgggtga ggggaaccag ttctaatagt 240
cctcaactcc actccagctg ttctgttcc acacgggtcca ctgagctggc ccagtccctt 300
tcaactcagt tgtcaccaaa ggcagcttca aggcctcaatg gcaagagacc acctataacc 360
tcttcacctt ctgctgcctc tttctgtctg cactgactgc catggccatc tgctatagcc 420
gcattgtcct cagtgtgtcc agggcccaga caaggaaggg gagccatggg gagactccaa 480
ttcccaggcc ttaatcctta accctagacc tgttgccctc agcatcattt atttatctac 540
ctacctaata gctatctacc agtcattaaa ccattgggtgag attctaacca tgtctagcac 600
ctgatgctag agataatttt gttgaatccc ttcaattata aacagctgag ttagctggac 660
aaggactagg gaggcaatca gtattattta ttcttgaaca ccatcaagtc tagacttggg 720
ggcttcataa ttctatcata atccctgggg gtaagaaatc atatagcccc aggttgggaa 780
ggggaaaacg gtttgcaaca ttctcctcct tgtaggaggc gagctctgtc tcactagcta 840
tgccctccca tcaattcacc ctatactcag atcagaagct gagtgtctga attacagtat 900
attttctaaa ttcttagccc ctgctgggtg atttgcctc ccccgctcct ttgacaattg 960
tccccgtgtt cgtctccggg ccttgagact ggccctgctt atcttgctga ccttcacctc 1020
ct 1022

```

<210> 68
 <211> 449
 <212> DNA
 <213> Homo sapien

```

<400> 68
ccagatccat ttctcagtgg ctggatttct ttttattttc ttttcaactt gaaagaaact 60
ggacattagg ccactatgtg ttgttactgc cactagtgtt caagtgcctc ttgttttccc 120
agagatttcc tgggtctgcc agaggcccag acaggctcac tcaagctctt taactgaaaa 180
gcaacaagcc actccaggac aaggttcaaa atgggtacaa cagcctctac ctgtcgcccc 240
agggagaaag gggtagtgat acaagtctca tagccagaga tgggtttcca ctcttcttag 300
atattcccaa aaagaggctg agacaggagg ttattttcaa ttttattttg gaattaaata 360
cttttttccc tttattactg ttgtagtccc tcacttggat atacctctgt tttcacgata 420
gaaataaggg aggtctagag cttctattc 449

```

<210> 69
 <211> 387
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (387)
 <223> n = A,T,C or G

```

<400> 69
gcccttagcg tgggtcgagg cncgangtct ggagcntatg tgatnccat ggtncncagg 60
cnnatactgc tantctcatt tattctcctg cnacctantc ctctnctctg gaatcacacc 120
attattgcct gttaacactg gactgtgagt accangcaat taatttgcac caanaaagtt 180
gagggtatta tcanatattg caatctgtac agagggaaga tgatttcaat ttgatttcaa 240
cttaaccttc atctttgtct gttaacacta atagagggtg tctaataaaa tggcaaattt 300
gngatctcat tnggtataac tacactcttt ttcacagatg tgatgactga atttccanca 360
acctgccccg gcggnccgntc naagggc 387

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<210> 70
 <211> 836
 <212> DNA
 <213> Homo sapien

<400> 70

tattccattt	acaaaataaa	ttcagccctg	cactttcttt	agatgccttg	atttccagaa	60
tggagcttag	tgctactgaa	taccctggcc	acagagccac	ctcaggatat	tcttttctcc	120
accctagttt	atttatttat	agatatctgt	ttacaaagtc	tgtagttaat	cctgatgctg	180
accatctgaa	atgtactttt	tttctgaatg	ctgtttcaat	ctaaaatagc	agcttttgag	240
aaaacaatga	tgtaaattcc	ttatgataaa	aggatgatcc	tatatattct	ttaatgatat	300
taaatatgcc	gaagccaagc	acacagtcct	tctaaagtgt	gtgtatgttt	gtgtgaatgt	360
gaatgatact	gatcttatat	ctgttataag	ttgtttttaa	aagctgtggc	atccccattg	420
tcatatttgc	caagtcttct	gtaaagatgt	ctaggacgaa	atattttatg	tgctaattgca	480
tgtatttgta	aaccagattt	gtttaccact	caaaattaac	ttgttttctt	catccaaaaa	540
agtttatttc	ttccacgtac	ttaaattttc	tgtgtgggta	taatatagct	ttctaatttt	600
tttctttcac	aaaggcaggt	tcaaaattct	gttgaaagaa	aaatgctttc	tgaaactgag	660
gtataacacc	agagcttgct	gtttaaagga	ttatatgatg	tacatcagtt	ctataaatgt	720
gctcagcagt	ttaacatgtg	aatcctgttt	taaagtgtc	agatttcaac	tgtgtaagcc	780
attgatataa	cgctgtaatt	aaaaatgttt	atatgaaaaa	aaaaaaaaaa	aaaaaa	836

<210> 71

<211> 618

<212> DNA

<213> Homo sapien

<400> 71

gttgacgtga	gctcaagtgt	tgggtgtatc	agctcaaaac	accatgtgat	gccaatcatc	60
tccacaggag	caatttggtt	accttttttt	tctgatgctt	tactaacttc	atctttttaga	120
tttaaatacat	tagtagatcc	tagaggagcc	agtttcagaa	aatatagatt	ctagttcagc	180
accacccgta	gttggtgcatt	gaaataatta	tcattatgat	tatgtatcag	agcttctggg	240
tttctcattc	tttattcatt	tattcaacaa	ccacgtgaca	aacactggna	ttacaggatg	300
aagatgagat	aatccgctcc	ttggcagtg	tatactatta	tataacctga	aaaaacaaac	360
aggtaatttt	cacacaaagt	aatagatata	atgacacatt	taaaataggg	cactactgga	420
acacacagat	aggacatcca	ggttttgggt	caatattgta	gacttttttg	tggtatgagat	480
atgcagggtg	atrccagaag	gacaacaaaa	acatatgtca	gatagaaggg	aggagcaaat	540
gccaaagagc	ggagctgagg	aagatcactg	tgaaattcta	tgtagtctag	ttggctggat	600
gctagagcaa	agaggtgg					618

<210> 72

<211> 806

<212> DNA

<213> Homo sapien

<400> 72

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tttgctgct	cagagtggcc	cctcagaaca	acagggtggg	ccttggaata	acccccaaac	120
aggactgtgg	tgacaactct	ggtcaggtgt	gatttgacat	gagggccgga	ggcggttgct	180
gacggcagga	ctggagaggc	tgctgtcccg	gcactggcag	cgaggctcgt	gtgtccccc	240
ggcagatctg	ggcactttcc	caacccaggt	ttatgccgtc	tccagggaag	cctcggtgcc	300
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ccagtcccc	ttcaaccag	ttgatgtaac	cacctcattt	ttacaaata	cagaatctat	420
tctactcagg	ctatgggcct	cgctctcact	cagttattgc	gagtgttgct	gtccgcacgc	480
tccgggcccc	acgtggctcc	tgtgctctag	atcatgggtg	ctccccgcc	ctgtgggtgg	540
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ccctttaatg	ggattgaaag	cacttttacc	acatggagaa	atatattttt	aatttgatgat	660
gcttttctac	aagggtccact	atctctgagt	ttaatgtgtt	tccaacactt	aaggagactc	720
taatgaaagc	tgatgaattt	tcttttctgt	ccaaacaagt	aaaataaaaa	taaaagtcta	780
tttagatggt	gaaaaaaaaa	aaaaaa				806

20

<210> 73
 <211> 301
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(301)
 <223> n = A,T,C or G

<400> 73
 actctggtaa gcttggtgtt gtccaagtga agctccctca gatgaggcgt gttggccana 60
 gagccattgt caacagcaga gatgctgttg aaactcaatc ccaacttagc caaattatcc 120
 agtcctttca ggctagctgc atcaactctg ctgattttgt tgccatcaag atgtaattcc 180
 gtaaggggaag gaggaagacc ttgaggaatg ctggygatat tggycatcagc aatgcggatg 240
 tasgaagagc ttcttcmttc cctggaaagc cccattttca atyccttgag ctcttcakcg 300
 g 301

<210> 74
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 74
 agttttacatg atccctgtaa cagccatggt ctcaaactca gatgcttcct ccattctgcca 60
 agtgtgttct ggatacagag cacatcgtgg cttctggggg cactctcagc ttaggctgtg 120
 ggtccacaga gcactcatct ggctgggcta tgggtgggtg ggctctactc aagaagcaaa 180
 gcagttacca gcacattcaa acagtgtatt gaacatcttt taaatatcaa agtgagaaac 240
 aagaaggcaa cataataatg ttatcagaaa gatgttagga agtaaggaca gctgtgtaaa 300
 gcttgaggct gaaaagtagc ttgccagctt catttctttg gtttcttggg tagtgggccg 360
 ccggaacagc aagatgtgag gttctggttc atggatcata t 401

<210> 75
 <211> 612
 <212> DNA
 <213> Homo sapien

<400> 75
 ttatttttca atttttatct tggttttctt acaaagggtg acattttcca taacagggtg 60
 aagagtgttg aaaaaaaaaat tcaaattttt ggggagcgag ggaaggagt aatgaaactg 120
 tattgcacaa tgctctgatc aatccttctt tttctctttt gccacaaatt taagcaagta 180
 gatgtgcaga agaaatggaa ggattcagct ttcagttaaa aaagaagaag aagaaatggc 240
 aaagagaaaag ttttttcaaa tttctttctt ttttaattta gattgagttc atttatttga 300
 aacagactgg gccaatgtcc acaaagaatt cctggtcagc accaccgatg tccaaagggtg 360
 caatatcaag gaagggcagg cgtgatggct tatttgtttt gtattcaatg attgtcttcc 420
 cccatttcatt tgtcttttta gagcagccat ctacaagaac agtgtaagt aacctgctgt 480
 tgccctcagc aacaagttca acatcattag agccctgtag aatgacagcc tttttcaggt 540
 tgccagtctc ctcatccatg tatgcaatgc tgttcttgca gtggtagggt atgttctgag 600
 aggcatagtt gg 612

<210> 76
 <211> 844
 <212> DNA
 <213> Homo sapien

<400> 76

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ggcttttcgag cggccgccccg ggcaggtctg atggttctcg taaaaacccc gctagaaact      60
gcagagacct gaaattctgc catcctgaac tcaagagtgg agaatactgg gttgacccta      120
accaaggatg caaattggat gctatcaagg tattctgtaa tatggaaact ggggaaacat      180
gcataagtgc caatcctttg aatgttccac ggaaacactg gtggacagat tctagtgtcg      240
agaagaaaca cgtttggttt ggagagtcca tggatggtgg ttttcagttt agctacggca      300
atcctgaact tctgaagat gtccttgatg tgcagcykgc attccttcga cttctctcca      360
gccgagcttc ccagaacatc acatatact gcaaaaatag cattgcatac atggatcagg      420
ccagtggaaa tgtaagaag gccctgaagc tgatgggggc aaatgaagggt gaattcaagg      480
ctgaaggaaa tagcaaattc acctacacag ttctggagga tggttgcacg aaacacactg      540
gggaatggag caaaacagtc tttgaatata gaacacgcaa tgctgttcct tgacattgca      600
ccaccaatgt ccagaggtgc aatgtcaagg aacggcaggg gagatggctt atttgttttg      660
tattcaatga ttgtcttgcc ccattcattt gtcttttttg agcagccatc gactaggaca      720
gagtaggatg acctgtgtt gccctcagca acaagttcca catcgttggg accctgcaga      780
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aatc

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<210> 77

<211> 314

<212> DNA

<213> Homo sapien

<400> 77

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ccagtcctcc acttggcctg atgagagtgg ggagtggcaa gggacgtttc tcttgcaata      60
gacacttaga tttctctctt gtgggaagaa accacctgtc catccactga ctcttctaca      120
ttgatgtgga aattgtgtgt gctaccacca cctcctgaag aggcttcctt gatgccaatg      180
ccagccatcc tggcatcctg gccctcgagc aggctgcggg aagtagcgat ctctgtctcc      240
agccgtgtct ttatgtcaag cagcatcttg tactcctggg tctgagcctc catctcgcac      300
cggagctcac tcag

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<210> 78

<211> 548

<212> DNA

<213> Homo sapien

<400> 78

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accaagagcc aagtgttaca caggatattt taaaaataaa atgttttttg aatcctcacc      60
tcccatgcta tcttctaaga taactacaaa tattcttcaa agatttaact gatttctgcc      120
aaggacctcc caggactcta tccagaatga ttattgtaaa gctttacaaa tcccaccttg      180
gccctagcga taattaggaa atcacaggca aacctcctct ctcgagagacc aatgaccagg      240
ccaatcagtc tgcacattgg ttttgttaga tactttgtgg agaaaaacaa aggctcgtga      300
tagtgcagct ctgtgcctac agagagcctc ccttttggtt ctgaaattgc tgatgtgaca      360
gagacaaaagc tgctatgggt ctaaaacctt caataaagta actaatgaca ctcaagggtcc      420
tgggactctg agacagacgg tggtaaaaacc cacagctgcg attcacattt ccaatttatt      480
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gcacagtc

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<210> 79

<211> 646

<212> DNA

<213> Homo sapien

<400> 79

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accccgctac tatgtgaata aaggcagcta gaaaatggac tcaattctgc aagccttcac      60

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ggcaacagcc catattaaga cttctagaac aagttaaaaa aaatcttcca tttccatcca 120
tgcattgggaa aagggtcttta gtatagttta ggatggatgt gtgtataata ataaaatgat 180
aagatatgca tagtggggga ataaagcctc agagtccttc cagtattggg aatccattgt 240
atcttagaac cgaggggattt gtttagattg ttgatctact aatttttttc ttcacttata 300
tttgaatttt caatgatagg acttattgga aattggggat aattctgttg tggattataa 360
taatatccat tttttaaaaa ctcatcttgg tattgagtta gtgcattgac ttccaatgaa 420
ttgacataag cccatatttc attttaacca gaaacaaaaa ctagaaaatg ttactcccta 480
aataggcaac aatgtatttt ataagcactg cagagattta gtaaaaaaca tgtatagtta 540
ctttagaaac aacttctgac acttgagggt tacccaatgg tctccttccc attctttata 600
tgaggtaaat gcaaaccagg gagccaccga ataaacagcc ctgagt 646

```

<210> 80

<211> 276

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(276)

<223> n = A,T,C or G

<400> 80

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gtctgaatga gcttcnctgc gagatgganc ancataaccc agaantccaa aancntanng 60
aacgnnaaaa cccgntngaa caagnaaacn gcaactnacg gccgcctgnt gnagggcgag 120
gacgccacc tctcctcttc ccagttcttc tctggatcgc agncatccan agatgtgacc 180
tcttcagcc gccaaatccg caccaagggt atggatgtgc acgatggcaa ggtgggtgtc 240
caccacgaa caggtccttc gcaccaagaa ctgagg 276

```

<210> 81

<211> 647

<212> DNA

<213> Homo sapien

<400> 81

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gtcctgcctt tcatcttttc tttaaaaaaa ataaatgttt acaaaacatt tccctcagat 60
tttaaaattc atggaagtaa taaacagtaa taaaatatgg atactatgaa aactgacaca 120
cagaaaaaca taaccataaa atattgttcc aggatacaga tattaattaa gagtgacttc 180
gttagcaaca cgtagacatt catacatatc cgggtggaaga ctggtttctg agatgagatt 240
gccatccaaa cgcaaagtgt tgatcttggg taggrtaat ggccccagga tcttgacagaa 300
gctctttatg tcaaacttct caagttgatt gacctccagg taatagtttt caaggttttc 360
attgacagtt ggtatgtttt taagcttgtt ataggacaga tccagctcaa ccagggatga 420
cacattgaaa gaatttccag gtattccact atcagccagt tcgttgtagag ataaacgcag 480
atactgcaat gcattaaaac gcttgaaata ctcatcaggg atgttgctga tcttattgtt 540
gtctaagtag agagttagaa gagagacagg gagaccagaa ggcagtctgg ctatctgatt 600
gaagctcaag tcaaggtatt cgagtgtttt aagaccttta aaagcag 647

```

<210> 82

<211> 878

<212> DNA

<213> Homo sapien

<400> 82

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ccttctttcc ccaactcaatt cttctgccc tgttattaat taagatatct tcagcttgta 60
gtcagacaca atcagaatya cagaaaaatc ctgcctaagg caaagaaata taagacaaga 120
ctatgatatc aatgaatgtg ggttaagtaa tagatttcca gctaaattgg tctaaaaaag 180

```

aatattaagt	gtggacagac	ctattttcaaa	ggagcttaat	tgatctcaact	tgtttttagtt	240
ctgatccagg	gagatcacc	ctctaattat	ttctgaactt	ggtaataaaa	agttttataag	300
atTTTTatga	agcagccact	gtatgatatt	ttaagcaaat	atgttattta	aaatattgat	360
ccttcccttg	gaccaccttc	atgttagttg	ggtattataa	ataagagata	caaccatgaa	420
tatattatgt	ttatacaaaa	tcaatctgaa	cacaattcat	aaagatttct	cttttatacc	480
ttcctcactg	gccccctcca	cctgcccata	gtcaccaaat	tctgttttaa	atcaatgacc	540
taagatcaac	aatgaagtat	tttataaatg	tatttatgct	gctagactgt	gggtcaaatg	600
tttccatttt	caaattattt	agaattctta	tgagttttaa	atttgtaaat	ttctaaatcc	660
aatcatgtaa	aatgaaactg	ttgctccatt	ggagtagtct	cccacctaaa	tatcaagatg	720
gctatatgct	aaaaagagaa	aatatggtca	agtctaaaat	ggctaattgt	cctatgatgc	780
tattatcata	gactaatgac	atTTatcttc	aaaacaccaa	attgtcttta	gaaaaattaa	840
tgtgattaca	ggtagagaac	ctcgccgcg	accacgct			878

<210> 83

<211> 645

<212> DNA

<213> Homo sapien

<400> 83

acaaacattt	tacaaaaaag	aacattacca	atatcagtgg	cagtaagggc	aagctgaaga	60
ataaatagac	tgagtttccg	ggcaatgtct	gtcctcaaag	acatccaaac	tgcgttcagg	120
cagctgaaac	aggcttcttt	cccagtgaca	agcatatgtg	gtcagtaata	caaacgatgg	180
taaagtaggc	tactacatag	gcccagttaa	caaactcctc	ttctcctcgg	gtaggccatg	240
atacaagtgg	aactcatcaa	ataattttaa	cccaaggcga	taacaacgct	atttcccatc	300
taaactcatt	taagccttca	caatgtcgca	atggattcag	ttacttgcaa	acgatcccgg	360
gttgctacac	agataactgt	ttttacacat	aacgctgtgc	catcccttcc	ttcactgccc	420
cagtcagggt	tcctgttgtt	ggaccgaaag	gggatacatt	ttagaaatgc	ttccctcaag	480
acagaagtga	gaaagaaagg	agaccctgag	gccaggatct	attaaacctg	gtgtgtgcgc	540
aaaagggagg	gggaaggcag	gaatttgaaa	ggataaacgt	ctcctttgcg	ccgaggaatc	600
aggaagcgtg	actcacttgg	gtctgggacg	ataccgaaat	ccggt		645

<210> 84

<211> 301

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(301)

<223> n = A,T,C or G

<400> 84

tctgatgtca	atcacaactt	gaaggatgcc	aatgatgtac	caatccaatg	tgaaatctct	60
cctcttatct	cctatgctgg	agaaggatta	gaaggttatg	tggcagataa	agaattccat	120
gcacctctaa	tcacgatga	gaatggagtt	catgggctgg	tgaaaaaatg	tatttgaacc	180
agataccaag	ttttgtttgc	cacgatagga	atagctttta	tttttgatag	accaactgtg	240
aacctacaag	acgtcttgga	caactgaagn	ttaaatatcc	acanggggtt	atTTtgcttg	300
g						301

<210> 85

<211> 296

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(296)
 <223> n = A,T,C or G

<400> 85
 agcgtgggtc gcggcncgan gtagagaacc gactgaaacg tttgagatga agaaagtctt 60
 cctcctgata acagccatct tggcagtggtc tgttggtttc ccagtctctc aagaccagga 120
 acgagaaaaa agaagtatca gtgacagcga tgaattagct tcagggtttt ttgtgttccc 180
 ttacccatat ccatttcgcc cacttccacc aattccattt ccaagatttc catgggtttan 240
 acgtaatttt cctattccaa tacctgaatc tgccctaca actcccttc ctagcg 296

<210> 86
 <211> 806
 <212> DNA
 <213> Homo sapien

<400> 86
 tctacgatgg ccatttgctc attgtctttc ctctgtgtgt agtgagtgc cctggcagtg 60
 tttgcctgct cagagtggcc cctcagaaca acagggtctg ccttgaaaaa accccaaaac 120
 aggactgtgg tgacaactct ggtcaggtgt gatttgacat gagggccgga ggcggttgct 180
 gacggcagga ctggagaggc tgcgtgcccg gcactggcag cgaggctcgt gtgtcccca 240
 ggcagatctg ggcactttcc caaccaggt ttatgccgtc tccagggaag cctcggtgcc 300
 agagtgggtg gcagatctga ccatcccccac agaccagaaa caaggaattt ctgggattac 360
 ccagtccccc ttcaaccag ttgatgtaac cacctcattt ttacaaaata cagaatctat 420
 tctactcagg ctatgggctc cgtcctcact cagttattgc gagtgttgc gtccgcagtc 480
 tccgggcccc acgtggctcc tgtgctctag atcatggtga ctccccgcc ctgtggttg 540
 aatcgatgcc acggattgca ggccaaattt cagatcgtgt ttccaaacac ccttgctgtg 600
 ccccttaatg ggattgaaag cacttttacc acatggagaa atatattttt aatttgtgat 660
 gcttttctac aagggtccact atttctgagt ttaatgtgtt tccaacactt aaggagactc 720
 taatgaaagc tgatgaattt tcttttctgt ccaaacaagt aaaataaaaa taaaagtcta 780
 tttagatgtt gaaaaaaaaa aaaaaa 806

<210> 87
 <211> 620
 <212> DNA
 <213> Homo sapien

<400> 87
 tttttgcatc agatctgaaa tgtctgagag taatagtctt tgttgaattt tttttgttcc 60
 atttttctgc acagtccatt ctgtttttat tactatctag gcttgaaata tatagtctga 120
 aattatgaca tccttcctct ttgttatttt cctcatgatt gctttggcta ttcaaagttt 180
 attttagttt catgtaaatt tttgaattgt attttccatt attgtgaaaa tagtaccact 240
 gcaattttta taggaagttt attgaatcta tagattactt tggataatat ggcacttcaa 300
 taatattcat gttttcaatt catagacaaa atattttaaa atttatttgt atcttttcta 360
 atttttcctt tttttattgt aaagatttac ctcttggtt aatattttcc tcagaaattt 420
 attatttaag gtatagtcaa taaaattttc ttctctat ttgtcagata gtttaagtgt 480
 atgaaaccat agatatactt gtatgttaat tttatatttt gctaatttac tgagtgtatt 540
 tattagttta gagaggtttt aatgtactgt ttatggtttt ttaaatataa gattacttat 600
 tttttaaaaa aaaaaaaaaa 620

<210> 88
 <211> 308
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(308)
 <223> n = A,T,C or G

<400> 88
 tagctgtgnt cagcaggccg aggttttttt tttttttgag atggagtctc gccctgtcac 60
 ccaggctgga gtgcagtggc ctgatctcag ctactgcaa gctccacctc ctggattcac 120
 gctattctcc tgcctcagcc tcccaagtag ctgggactac aggcgcccgc caccacgccc 180
 agctaattnt ttgnattttt agtacnagat gcgggtttcat cgtgttagcc agcatgggct 240
 cgatctcctg acctcgtgaa ctgcccgcct cggcctccca aagacctgcc cgggcngggc 300
 gctcgaaa 308

<210> 89
 <211> 492
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(492)
 <223> n = A,T,C or G

<400> 89
 agcggcgcgc cgggcaggtc tgttaagtaa catacatatc accttaataa aaatcaagat 60
 gaaatgtttt agaaactatt ttatcaaaaag tggctctgat acaaagactt gtacatgatt 120
 gttcacagca gcactattaa tgccaaaaag tagacaaaac ctaaatgtcc attactgat 180
 aagcaaatg tggatatatc atacaatgga atattatgta gccacaaca tggcatggag 240
 tactacaaca tggatgagcc tcaaaaacgt tatgctaaat gaaaaaagtc agatatagga 300
 aaccacatgt catatgatcc catttatatg aaatagccag aaaaggcaag tcatagaaac 360
 aagatagatc ggaaaatggg ttggaggact acaaatggca ccagggatct ttgaagttga 420
 tggaaatggt ctaaaatcag actgtggnTG tggttgaaca agtctgtaaa tttaccaaaa 480
 tgcgttaata ca 492

<210> 90
 <211> 390
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(390)
 <223> n = A,T,C or G

<400> 90
 tcgagcggcc gcccgggcag gtacaagctt tttttttttt tttttttttt ttttctaaca 60
 gttctctgtt ttattgcaat acagcaaagt ctgggttaata ttaagngata tcaacataaa 120
 gtattggtga ggagtctttt gtgacatttt ttaccatccc accttaataa tttctgtgca 180
 aaanaatcca catcattgtt tgggtancana ggatctctta aaaagttccc taanacactg 240
 agggcataaa accaaaacaaa ataaaataag gagtgatagg ctaaagcagt atcttcccct 300
 ccatccacat ttgncaagca ttatattcta accaaaaaat gatcacacca ggccatgcaa 360
 aactgtccaa tattaccgag aaaaaaccct 390

<210> 91
 <211> 192

<212> DNA

<213> Homo sapien

<400> 91

agcgtggtcg	cggccgaggt	ctgtcaatta	atgctagtc	tcaggattta	aaaaataatc	60
ttaactcaaa	gtccaatgca	aaaacattaa	gttggttaatt	actcttgatc	ttgaattact	120
tccgttacga	aagtccttca	cattttttcaa	actaagctac	tatattttaag	gcctgcccgg	180
gcggccgctc	ga					192

<210> 92

<211> 570

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(570)

<223> n = A,T,C or G

<400> 92

agcgtggtcg	cggccgaggt	ctgacaacta	acaaagaagc	aaaaactggc	atcttggaca	60
tcctagtatt	acacttgcaa	gcaattagaa	cacaaggagg	gccaaggaaa	aagtttagct	120
ttgaatcact	tccaaatcta	ctgattttga	ggttcgcag	tagttctaac	aaaacttttc	180
agacaatggt	aactttcgat	taagaaagaa	aaaaacccca	aacatcttca	ggaattccat	240
gccaggttca	gtctcttcca	gtgagccgc	ttgctaaaag	tccacgtgca	ccattaatta	300
gctgggctgg	cagcaccatg	taaaaagaag	cctattcacc	accaaccaca	cagactagac	360
atgtaaagta	ggatcaagta	atggatgaca	accatggtcg	tggaatatgg	tcaatgagag	420
tcagaaaagt	acaggcacca	gtacaagcag	cagataacag	aattgacggg	ccaaaggata	480
aaaataggct	tatttaaata	ggatgctaca	gaacacatnc	acttctaatt	ggaagctgct	540
ttacactggg	tggcattgna	ccatatgcat				570

<210> 93

<211> 446

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(446)

<223> n = A,T,C or G

<400> 93

tcgagcggcc	gcccgggcag	gtccaggttt	ttatttagtt	gtgtaatctt	ggacaagtta	60
cctaactttt	ttgagtctga	atatatttaa	tctgcaaaat	gagaatcatg	ataatacgtc	120
ataggcttaa	ttaggaggat	taaatgaaat	aatttatagg	tggtgccatg	gttacataca	180
agtattagta	gttaattctt	ttcctttgtt	tacttttata	gtataggttg	gatgaagggt	240
ccagtatagg	caaaaaatact	acttgggggt	aaagtagagt	gtgatacttt	atttgaaatg	300
ttccctgaat	ctgatcttta	ctttttgnta	ctgctgcact	acccaaatcc	aaattttcat	360
cccaacattc	ttggatttgt	gggacagcng	tagcagcttt	tccaatataa	tctatactac	420
atcttttctt	actttggtgc	tttttg				446

<210> 94

<211> 409

<212> DNA

<213> Homo sapien

<400> 94

cgagcggccg	cccgggcagg	tccatcagct	cttctgctta	gaatacgagg	cagacagtgg	60
agagggtcaca	tcagttatcg	tctatcaggg	tgatgaccca	agaaagggtga	gtgagaagggt	120
gtcggcacac	acgcctctgg	atccacccat	gcgagaagcc	ctcaagttgc	gtatccaggga	180
ggagattgca	aagcgccaga	gccaacactg	accatgttga	aggcgttctc	tccaggctgg	240
attcactgca	ctcggaagaa	ttctgcccag	ggaatttagt	gtgggggtac	caggaccagt	300
ttgtcttgat	cttgagaccc	ccagagctgc	tgcattccata	gggtgttgca	ggactacacc	360
tggcctgcct	tgcagtcatt	ctttcttata	tggtgaccca	tttgcccaa		409

<210> 95

<211> 490

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(490)

<223> n = A,T,C or G

<400> 95

tcgagcggcc	gcccgggcag	gtcctacttg	tttgcagctt	ccacacactg	cacctaccta	60
ctacctctct	tccatgctta	actgggttta	gaaagggtgag	ctatgcgtag	aagaactact	120
tgggatattc	aagtgcgtga	tttgaacgat	aagcctatag	ataacagtct	gaagctgcaa	180
gggagacttt	gttagtacac	tactataaac	aggtaaacta	cctgtttgta	cttgatatag	240
tgcatatgaa	atgactgatt	taatacaaaa	ctacagaaca	tgcaaaattt	tttctgagat	300
gttaagtatt	acttcagtgg	agaacaaaac	ttacttaacc	tttcgctaata	gcatgtagta	360
ccagaaagca	aacatgggtt	tagcttcctt	tactcaaaat	atgaacatta	agtgggtgtg	420
aattttgtct	gccaagtggg	tcagaaaata	cattataaat	aacctaagtt	aaaaaaaaaga	480
aactgngaac						490

<210> 96

<211> 223

<212> DNA

<213> Homo sapien

<400> 96

agcgtggctg	cggccgagggt	ctggaagccc	accctaggac	ttgaatggca	ccttgtcctt	60
tctctgccag	taatgcaatc	caacacaata	tgctacaggg	aaaacagaat	ttccacgggtg	120
ccgccctctg	gtacaaggga	aacagcacgc	aaagcaaaaag	gccacagagg	gctccctgag	180
aatccagtac	aactaagcga	ggacctgccc	gggcggccgc	tcg		223

<210> 97

<211> 527

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(527)

<223> n = A,T,C or G

<400> 97

tcgagcggcc	gcccgggcag	gtctgtgcag	gagacactga	agtgggtagt	gtccataatc	60
tttttagcct	gttgcgtgaa	ttccagttgt	actccttcaa	accaaaatgc	ttacaggatc	120

28

atgggaaagc	ctcgggttgca	gaaatcaaga	caggcaagtg	ggaagataac	tcggcctttga	180
ggttaaacag	atctgggttc	aaagcatagt	ttcactctct	gtcttggtgaa	gtgtcctggg	240
tgaagtcatt	tcctctcttg	aatttcagag	aggatgaaaa	tataaaaagt	ataataacta	300
tccttcataat	ctttgtgagg	attaaagaag	acgaagtgtg	tgaaaagcta	agcacagagc	360
aggcattcta	caataagtag	ttattatttt	tggaaaccatc	ccgnccctag	ccccagccca	420
attaccttct	cttagnctct	tcatatcgaa	ngcgtaatc	ttgaccttct	cttgcnactg	480
gattggtgct	ggttgatgcc	caaacttccc	gagatgctgt	ctgggaa		527

<210> 98
 <211> 514
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(514)
 <223> n = A,T,C or G

tcgagcggcc	gcccgggcag	gtctggctcc	catggccctt	ggggtggcct	gactctgtca	60
ctattcctaa	aaccttctag	gacatctgct	ccaggaagaa	ctttcaacac	caaaattcat	120
ctcaatttta	cagatgggaa	aagtgattct	gagaccagac	cagggtcagg	ccaaggatcat	180
ccagcatcag	tggctgggct	gagactgggc	ccaggggaacc	ctgtctgtct	ctctttttcc	240
cagagctgtg	agttctctag	ccaaggctgc	actcttgagg	gagagccagg	aagcatagct	300
gaggccatga	caacctcact	cttcacctga	aaatttaacc	cgtggcagag	gatccaggca	360
catataggct	tcggagccaa	acaggacctc	ggccgcgacc	acgctaagcc	gaattccagc	420
acactggcgg	ccgttactag	tggatccccg	gcttnggtac	caagcttggc	gtaatcatgg	480
gcatagctgg	ttcctggggc	gaaaatggta	tccc			514

<210> 99
 <211> 530
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(530)
 <223> n = A,T,C or G

tcgagcggcc	gcccgggcag	gtctgaagaa	acagggtataa	atttggcagc	cagtaatttt	60
gacaggggaag	ttacagcttg	catgacttta	aatatgtaaa	tttgaaaata	ctgaatttcg	120
agtaatcatt	gtgctttgtg	ttgatctgaa	aaatataaca	ctggctgtcg	aagaagcatg	180
ttcaaaaata	tttaattcac	ttcaaaatgt	catacaaatt	atggtggttt	ctatgcaccc	240
ctaaagcttc	aagtcattta	gtcagggtac	atactaaagt	aatatattaa	ttcttccagt	300
acagtgggtg	ttcataccat	tgacatttgc	ataccctaga	ataatttaag	aaagacatgt	360
gtaatatcca	caatgttcag	aaaagcaagc	aaaagggtcaa	ggaacctgct	ttggttcttc	420
tggagatggg	ctcatatcag	cttcataaac	attcattcta	caaaatagta	agctaaccat	480
ttgaacccca	atttccagat	taagcatatt	ttctcataaa	tnatgaagcc		530

<210> 100
 <211> 529
 <212> DNA
 <213> Homo sapien

<400> 100

agcgtggtcg	cggccgaggt	ccaggcacgg	tggcttatgt	gtgtaatccc	agcacttggg	60
gaggctgagg	gaggtggatc	acttgagtc	aggagtttga	gaccagtctg	ggcaacatgg	120
cgaaacttca	tcactaccaa	agaagaaaaa	aattagccag	gtgtggtggt	gtatgcctgt	180
agtcccagat	actctggtgg	ctgaggtgag	aggatagctt	gagcccagga	aattgaggct	240
gcagtgaact	atgattgcac	tactgtgctc	cagcttgggc	aacagagtga	gatcttgtct	300
ccaaaagtcc	ttgaaggatt	ttaggaagtt	gttaaaagtc	ttgaaacgat	gtttgggggc	360
atgttagggg	tcttgaatgt	ttaattcctc	taataactgc	ttattcaaga	gaagcatttc	420
tgactgggtg	cggggcagtg	gcttcatgcc	ccataatccc	agtactttgg	gaggctgaag	480
caggaacatt	gcttgagccc	aggacttcaa	gaacagcctg	ggtaacata		529

<210> 101

<211> 277

<212> DNA

<213> Homo sapien

<400> 101

tcgagcggcc	gcccgggcag	gtcgcaggaa	gaggatggaa	actgaggagt	ccaggaagaa	60
gagggaaacga	gatcttgagc	tggaaatggg	agatgattat	atcttggatc	ttcagaagta	120
ctgggatttta	atgaatttgt	ctgaaaaaca	tgataagata	ccagaaatct	gggaaggcca	180
taatatagct	gattatattg	atccagccat	catgaagaaa	ttggaagaat	tagaaaaaga	240
agaagagctg	agaacagacc	tcggccgcga	ccacgct			277

<210> 102

<211> 490

<212> DNA

<213> Homo sapien

<400> 102

gcgtgggtcg	ggccgaggtc	tgacggcttt	gctgtcccag	agccgcctaa	acgcaagaaa	60
agtcgatggg	acagttagag	gggatgtgct	aaagcgtgaa	atcagttgtc	cttaattttt	120
agaaagattt	tggtaaactag	gtgtctcagg	gctgggttgg	gggtccaaagt	gtaaggaccc	180
cctgccctta	gtggagagct	ggagcttggg	gacattaccc	cttcattcaga	aggaattttc	240
ggatgttttc	ttgggaagct	gttttgggtc	ttggaagcag	tgagagctgg	gaagcttctt	300
ttggctctag	gtgagttgtc	atgtgggtta	gttgaggtta	tcttgggata	aagggtcttc	360
tagggcacaa	aactcactct	aggtttatat	tgtatgtagc	ttatatattt	tactaagggtg	420
tcaccttata	agcatctata	aattgacttc	tttttcttag	ttgtatgacc	tgccccgggc	480
ggccgctcga						490

<210> 103

<211> 490

<212> DNA

<213> Homo sapien

<400> 103

gagcggccgc	ccgggcaggt	ccaaaccagc	ttgctcataa	gtcattaacc	aatccatta	60
taggtaattt	gttcagttca	atgtttacaa	ttcttatgga	aaaaattagc	aacacacaca	120
tttaaaacgt	gtgcatttac	ctttgcgtga	gtgcttaaaa	tacatatattc	tattttcaaga	180
tgacatttaa	aaattattct	aatatatcag	cagcaaaaat	ataatttgca	attacaaaaa	240
actaaactag	aatccttaag	ttattctcat	gtttacagtt	gtgattcttt	aataaatact	300
attatgcagc	tctattgttt	aagctttctg	gatttgggtt	aaacacatgc	atataatttg	360
tcaattgtgg	gaagctttac	aagttatatt	ccatgcactt	tttggacaga	gttctaacag	420
agccagccag	tccacaaaaa	aggcaagaca	aaagttgaat	taactggggc	aaaataggac	480
tcttatgcaa						490

<210> 104
<211> 489
<212> DNA
<213> Homo sapien

<400> 104
cgtggtcgcg gccgaggtcc aggctggctc cgaactcctg accttgtgat ctgccccgct 60
cggcctccca aagtgttggg attacaggca tgagccactg cgcccgaccg agttgaacat 120
ttaatgtcag actaggccag agtttctcaa tctttttatt ctcaacttccc aaaggagccg 180
ttggagattt tccccctcaat ctctctcctt catgaaattt cataccacaa atatagtatg 240
ttttatttat gtactgtgac cttttgaagg atcacaaacc aatataatag tttttctttt 300
taaccgcgtca aggaccaagt ttttgccctt gttggaaatg cataaactgg actgatgaat 360
tggtatagat ggcttttatc atgaggatca gaaaaacttg aaattccttg gctacgacac 420
tccatattta tcaccgtata gggaggacct tggtatgggg aagtagaaac acttctacac 480
tttacagca 489

<210> 105
<211> 479
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(479)
<223> n = A,T,C or G

<400> 105
gcgtggtcgc ggccgaggtc tgactggctt cagccccaga agttgagctg gccttttagac 60
aaaataattg cacctccctc tgctgcttat tcccttccgt ttttcatttg agtgatgaaca 120
gttagataaa atctgtggct gnetcttcca ccttgctcta gtttccattg ctgtgagcag 180
gccctcctat gccccgcatt tagctacaat gctgtggact cacttgattc tttttctccg 240
agctttgtct agaaatatgt gaagggtgagg ttaagtgtt ctctgtgtag atccacttag 300
ccctgtctgc tgtctcgatg ggcgttgctt cgtctctcct ctcttccatc ctttccattt 360
gcttctcacc accttctggc ttcttttctt aatgcaataa aggcagtttc taacaaagaa 420
agaatgtggg ctttggagtt agacagacct ggntttaaat tctgcttctg gctctccaa 479

<210> 106
<211> 511
<212> DNA
<213> Homo sapien

<400> 106
tcgcggccga ggtccaaaac gtggattcca atgacctgcc ttgagccgc ggttgccagg 60
agttggacct gcagtagtat gggaaagctca cggcctaata accgactgcc ctctgacccc 120
accgtccagc gattctagaa ctttcttagt aggaaagaca tagcaaggga ttttcatgat 180
tgggaaatac tgggagacaa gctgaagatt tgtaagggc tatgcttctg tcatctttta 240
ggtatttaag gctactcctt tagctagcta ctttgagctg tttaaagtga ctatctccct 300
acacagagtt acacaatgag catctctgaa agagaatatt accctggatt tccaaagatg 360
tactctaaca ggatgaccag gcaaaagggtg acccggggga ggagtctgtt ataacactcg 420
gacccacatg ttctcaaggc acttcagaac tttgggaaat cattttgtac cggatcctca 480
gaaagcattt atggaaatac acatccttta g 511

<210> 107
<211> 451
<212> DNA

<213> Homo sapien

<400> 107

ggccgcccgg	gcaggtccag	aatatcaaat	caaaagggtca	caaagtgtca	cttctctctc	60
cacctcttta	catattggat	cttcaattgc	aatagggagt	gtaagatggg	catttttagag	120
acgtagtgtc	atcagcagaa	gcaaaccat	cttatacaaa	tgggttttgg	ggataggaaa	180
aggctgctaa	aaattcacaa	gtcaccattc	cccagaagca	atgaatagcc	gtagaagacc	240
aaggaagatc	aacaagtttc	caaagtgtca	aagccagaga	tttggccctt	ccaaaatacc	300
accaggacgc	ctggaccctg	gggtctctcg	catgtcacca	ctgactgcca	ggatgctgct	360
gcacctccct	tccttgagac	acaacagaga	gacagtgaag	tcaccaaga	ctgggatcat	420
cagaggctcc	tcatgcttgc	tacagagaag	c			451

<210> 108

<211> 461

<212> DNA

<213> Homo sapien

<400> 108

ccgccccggg	aggctctgaa	aacattcaga	ctaatacaaaa	tgggtactact	gtaacttctt	60
ataatacata	atataaaaagt	ttttgaaaga	tatagacaca	attaaccctt	aaacaacaca	120
ctatctgatt	ctcaaaaagca	atggctatct	aacaagatgt	aaaaggacaa	taacatatca	180
aagaactttc	acacacctaa	agatagcatt	tagcagcaag	ttagtcagac	aaaacaaaca	240
caaataatct	cacatttctt	atgtttgttt	ttaactttac	ttcataaagc	caactgataat	300
tgaggtttct	ttcaagtata	agatttctaa	aattaaaaac	tgtttttgac	atatttttat	360
aaagaaataa	aaagcaaaaac	gcaatccaac	tatttatatg	agtccctctt	ctccaacagc	420
tttagatggg	tttctgagta	ctttttttaca	cagaatattt	t		461

<210> 109

<211> 441

<212> DNA

<213> Homo sapien

<400> 109

ggccgcccgg	gcaggtctga	ttataagaga	aagaaatcca	gtgacacgag	ggcagggcagg	60
ccccgctctg	ctctgatcga	gaaaagcttc	ctgatgtcag	ggagatggaa	ctgccaccat	120
cagaaccatg	gcactttggg	tgaagggtgtg	tcagcgacca	agggggcagg	aaatgggcag	180
tgactaaggg	ggcaggaaac	aggcaggcac	atggcaaggt	tctcccagcc	catcagccca	240
gtgatggcct	cgattttgaa	gctgcactac	tgtctgaaaa	gcacaattac	tggtgactct	300
taacaaactt	cagcactactg	gggaaggaga	ctgtcaagta	actgaattgg	aaagatgaaa	360
aagaaccatc	tctaaaagt	gatgcttgtc	agaagaataa	cctcctttgt	gcaagtcttg	420
caacatcttc	attcaaccac	a				441

<210> 110

<211> 451

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(451)

<223> n = A,T,C or G

<400> 110

ggtcgcggcc	gaggtctggg	gaaggggtga	gaatccctgg	gccttgccca	gtcctgagct	60
ctgggtgtct	gcaggggaagc	acagtgggtga	gttagtggtta	aagaaagcat	ccagagaggt	120

```

aagaggggct tgggtagcac cctttgcctc tgtcacttcc gcaaaaactt cttgttgagg 180
aggaagatga gaaggttgac attgactttg gccttggtga agagtttcat gacagccaca 240
ccctcatact ggagctgcan gagatcctga tagtgaagct tgaaatcgct ccatgtccac 300
acccaggaac ttggcattta cttcaaactt tcttgctca tctcccggcg tgatgtcaaa 360
natgacgttt cttgaagtga gaggcgggaa agatcttcaa tttccaccaa agacaccctt 420
ttccaggaa gcttgagcaa caagtgaat g 451

```

```

<210> 111
<211> 407
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(407)
<223> n = A,T,C or G

```

```

<400> 111
ggccgacgtt cgacctgact tctttngagc agntgncact acccgtcttg aggaatgccg 60
actgcagaca gtggcccang gcaaagagtg tgcgtcatcg atganattgg naagatggag 120
ctcttcagtc agnttttcat tcaagctgnt cgtcagacgc tgtctacccc agggactata 180
atcctnngca caatcccagt tcctanagga aagccactgn ctcttgtaga agaaatcana 240
cacanaaagg atgtgaacng tgtttaatgt caccaagggg aaacatgaaa ccaccttctg 300
ccagatatcg ggacgttgcg tgcagatcaa gcacgnaagt gaagacgcgt gcattccttg 360
ccttcctgta acgantgccc agntcaagaa gancctgatg gaaccct 407

```

```

<210> 112
<211> 401
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 112
tcgcgggccga ggtcggccga ggtctgacat ctgttgctctg tgataaccac ttctgtattg 60
cgtcttaacc acttctgtat tgtgtggttt taactgccta aggcggcaat gggcagtggg 120
cccctttccc ttaggatggg tatcaattca acaatattta taaggcattt actgtgtgct 180
aagcatttgg aagacccagg ctacaaaata agacatagtt cctgccctcc aggccagcag 240
agggaggcac aaatacccag gaatctctga tgggtgtgaa gtgcggtcgt gggccacaga 300
aaatgaccgt catggagacc ctgctaaagg tcggaccctg agcccaaagg ggtattcaga 360
agnggagatg attttggccc cactcataga tgggtggcaa a 401

```

```

<210> 113
<211> 451
<212> DNA
<213> Homo sapien

```

```

<400> 113
gtcgcggccg aggtccatat taaaaagtc atcataaaca aagactcctc ctcatggtat 60
gaatatgctc catatgccc aataagggtgca taacggactt agaaattcca atgagtctta 120
gggttgaaat ttccaatgac ctgagcaagg cagctcccta tagcttctgg ataactttt 180
acaccagag ttcaggctta aacagaccta tcaacacaat tattttcgga ttgtctgtct 240

```

```

agaaaacggc aatgctcaaa ggaatataaa taagggtggg gggacatatg ctccagcct      300
ggcctttctc catgtggtaa aaaacaatgg aatggctgtg ttaatttttt ttaattcttt      360
tctgaccttt actatgtttg gtaatggaaa taagtcaggg aaaacaaaat gaacaggtct      420
catcacttaa ttaatactgg gttttcttct t                                451

```

```

<210> 114
<211> 441
<212> DNA
<213> Homo sapien

```

```

<400> 114
ggccgccccg gcaggtccat cctgtcagag atgggagaag tcacagacgg aatgatggat      60
acaaagatgg ttcactttct tacacactat gctgacaaga ttgaatctgt tcatttttca      120
gaccagttct ctgggtccaaa aattatgcaa gaggaagggtc agcctttaaa gctacctgac      180
actaagagga cactgttggt tacatttaac gtgcctggct caggtaacac ttacccaaag      240
gatatggagg cactgctacc cctgatgaac atgggtgatt attctattga taaagccaaa      300
aagttccgac tcaacagaga aggcaaacia aaagcagata agaaccgtgc ccgagtagaa      360
gagaacttct tgaaacttga cacatgtgca aagacaggaa gcagcacagt ctggcgggga      420
ggaagaaaaa aagaacagag a                                441

```

```

<210> 115
<211> 431
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G

```

```

<400> 115
gccgccccgg caggtccatt ggcggtgaca aaaggaaaag aagcaaagag actcagtcca      60
taatgctgat tagttagaag aaagggttag gattgagaaa gtaccaggaa cttttaatta      120
tttaaaagag aatgctgact gtaaatgttt taaatcttac tgttcaaagt tactaatatg      180
aattttttacc ctttgtgcat gaatattcta aacaactaga agacctccac aatttagcag      240
ttatgaaagt taaacttttt attataaaaa ttctaaacct tactgctcct ttaccaggaa      300
catgacacac tatttancat cagttgcata cctcgccaat agtataattc aactgtcttg      360
cccgaacaat catctccatc tggaagacgt aagccttttag aaacacattt ttctattaat      420
ttctctagaa c                                431

```

```

<210> 116
<211> 421
<212> DNA
<213> Homo sapien

```

```

<400> 116
gtcgcggccg aggtccagaa atgaagaaga agtttgcaga tgtattttgca aagaagacga      60
aggcagagtg gtgtcaaata ttgacggca cagatgcctg tgtgactccg gttctgactt      120
ttgaggaggt tgttcatcat gatcacaaca aggaaccggg gctcgtttat caccagttag      180
gagcaggacg tgagcccccg ccctgcacct ctgctgttaa acaccccagc catcccttct      240
ttcaaaaggg atcctttcat aggagaacac actgaggaga tacttgaaga atttgattc      300
agcccgcgaa gagatttatc aagcttaact cagataaaat cattgaaagt aataaggtaa      360
aagctaagtc tctaacttcc aggccacagg ctcaagtga ttcgaatac tgcatttaca      420
g                                421

```

<210> 117
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 117
 agcgtggtcg cggccgaggt aaggctgcga ggttggtggtg tctgggaaac tccgaggaca 60
 gagggctaaa tccatgaagt ttgtggatgg cctgatgac caccagcgag accctgttaa 120
 ctactacgtt gacactgctg tgcgccacgt gttgctcaga cagggtgtgc tgggcatcaa 180
 ggtgaagatc atgctgccct gggacccaac tggtaagatt ggccctaaga agcccctgcc 240
 tgaccacgtg agcattgtgg aaccctaaaga tgagatactg cccaccaccc ccatctcaga 300
 acagaagggg ggggaagccag agccgcctgc catgccccag ccagtcccca cagcataaca 360
 gggctctcctt ggcagacctg cccgggcggc cgctcgaaag cccgaattcc agcacactgg 420
 cggccgttac tagtggatcc cagctcggtt ccaagcttgg cgtaatcatg gtcatactgt 480
 gtttcctgt 489

<210> 118
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 118
 tcgagcggcc gcccgggcag gtattgaata cagcaaaatt ctatatacaa agtgacctgg 60
 acctgctgct tcaaaacatg atcctttctt actaatatct tgatagtcgg tccatagagc 120
 attagaaaagc aattgactct taaataaaca gaaaagtgc taatgcacat taaatgaatg 180
 gcctaactac tggaaacttta gtagttctat aagggtgatta acataggtag gatccagttc 240
 ctatgacagg ctgctgaaga acagatatga gcatcaagag gccattttgt gcaactgccac 300
 cgtgatgcca tcgtgtttct ggatcataat gttcccatta tctgattcta gacacaccac 360
 aggaatatca gtggggtcag aggttagctt agctgcttgc tgggctagaa cagatatcac 420
 tccagcatgc tcatctgaca gggctccgcg gcaaccaga ttaagtcctt gtgaatctgt 480
 gcacaggga 489

<210> 119
 <211> 181
 <212> DNA
 <213> Homo sapien

<400> 119
 taggttccag agacttttgg cccaggagga atatttactt ttagctctgg acatcattac 60
 aaaaagggaat atttcccaa cctcttcaga ccgagaatac atgggtaaaa ttattaaata 120
 gttgtataat aaaaataatt ttttccttaa aaaaaaaaaa aacctcggcc gcgaccacgc 180
 t 181

<210> 120
 <211> 489
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(489)
 <223> n = A,T,C or G

<400> 120
 gcgtggctgc ggccgaggtc catttaaaac aaagaaaaat actaaagcca ctagtaaaca 60

```

tctgatgtgc aaaatacaac atcctctagt tggctttatg ccattattac ataagctcca 120
aatagctcat cttaaattaa aaagaaaaag tggctgtccc atctctgctg cataaatcag 180
atTTTTTTTT aaaggttttag agtactttta ggaaggggaag ttcaaaactg ccagtgaat 240
tcacagagaa tacaaattta gcaattttaat ttcccaaagc tctttgaaga agcaagagag 300
tctctcttct taatgcagtg ttctcccaag aggaactgta attttgcttg gtacttatgc 360
tgggagatat gcaaaatgtg tttttcaatg ttgtctagaa tataatgggt cctcttcagt 420
gnctgggttca tcttggaact catgggttaa gaaggacttc ttggagccga actgcccggg 480
cgggccntt 489

```

```

<210> 121
<211> 531
<212> DNA
<213> Homo sapien

```

```

<400> 121
cgagcggccg cccgggcagg tggccagcgc tgggtccgca gacgccgaga tggaggaaat 60
atttgatgat gcgtcacctg gaaagcaaaa ggaaatccaa gaaccagatc ctacctatga 120
agaaaaaatg caaactgacc gggcaaatag attcgagtat ttattaaagc agacagaact 180
ttttgcacat ttcattcaac ctgctgctca gaagactcca acttcacctt tgaagatgaa 240
accagggcgc ccacgaataa aaaaagatga gaagcagaac ttactatccg ttggcgatta 300
ccgacaccgt agaacagagc aagaggagga tgaagagcta ttaacagaaa gctccaaagc 360
aaccaatggt tgcactcgat ttgaagactc tccatcgat gtaaaatggg gtaaaactgag 420
agattatcag gtcccagga ttaaaactggc tcatttcttt gtatgagaat ggcataatg 480
gtatccttgc agatgaaatg ggcttaggaa agactcttca acaatttctc t 531

```

```

<210> 122
<211> 174
<212> DNA
<213> Homo sapien

```

```

<400> 122
tcgagcggcc gcccgggcag gtctgccaac agcagaggcg gggcctccgg catcttcaaa 60
gcacctctga gcaggctcca gccctctggc tgcgggaggg gtctggggtc tctctgagc 120
tcggcgacaa agcagatggt atttctctcc cgcgacctcg gccgcgacca cgct 174

```

```

<210> 123
<211> 531
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (531)
<223> n = A,T,C or G

```

```

<400> 123
agcgtggctg cggccgaggt cctcaaccaa gagggttgat ggctccagt caagaaactg 60
tggctcatgc cagcagagct ctctcctcgt ccagcaggcg ccattgcaagg gcaggctaaa 120
agacctccag tgcattcaaca tccattctagc anagagaaaa ggggactga agcagctatg 180
tctgccaggg gctaggggct cccttgcaaga cagcaatgct acaataaagg acacagaaat 240
gggggagggt ggggaagccc tatttttata acaaagtcaa acagatctgt gccgttcatt 300
ccccagaca cacaagtaga aaaaaaccaa tgcttgtggt ttctgccaag atggaatatt 360
cctccttctt aanttccaca catggcctgt tgcaatgctc gacagcattg cactgggctg 420
cttgtctctg tggctctgggc accagtagct tgggccccat atacacttct cagttcccac 480
anggcttatg gccnangggc angctccaat tttcaagcac cacgaaggaa g 531

```

<210> 124
 <211> 416
 <212> DNA
 <213> Homo sapien

<400> 124
 tcgagcggcc gcccgggcag gtccatctat actttctaga gcagtaaattc tcataaattc 60
 acttaccaag cccaggaata atgactttta aagccttgaa tatcaactaa gacaaattat 120
 gccaatctcg atttctcaca tatacttaga ttacacaaag ataaagcttt agatgtgatc 180
 attgtttaat gtagacttat ctttaaagtt ttttaattaaa aactacagaa gggagtaaac 240
 agcaagccaa atgatttaac caaatgattt aagagtaaaa ctactcaga aagcattata 300
 cgtaactaaa tatacatgag catgattata tacatacatg aaactgcaat tttatggcat 360
 tctaagtaac tcatttaagt acatttttgg catttaaaaca aagatcaaatt caagct 416

<210> 125
 <211> 199
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(199)
 <223> n = A,T,C or G

<400> 125
 agcgtggctcg cggccgaggt gctttttttt tttttttttt tttttttttt gctattctaa 60
 aggggaaggc ccttttttat taaacttgta cattttactt tccttctttc anaatgctaa 120
 taaaaaactt ttgtttatac ttaaaaaaac cataaatcan acaaacaaaa gaaacgattc 180
 caacatcact tctgngatg 199

<210> 126
 <211> 490
 <212> DNA
 <213> Homo sapien

<400> 126
 cgtggtcgcg gccgaggtcc agttgctcta agtggattgg atatggttgg agtggcacag 60
 actggatctg ggaaaacatt gtcttatttg cttcctgcca ttgtccacat caatcatcag 120
 ccattcctag agagaggcga tgggcctatt tgtttggtgc tggcaccaac tcgggaactg 180
 gcccaacagg tgcagcaagt agctgctgaa tattgtagag catgtcgctt gaagtctact 240
 tgtatctacg gtggtgctcc taagggacca caaatacgtg atttggagag aggtgtggaa 300
 atctgtattg caacacctgg aagactgatt gacttttttag agtgtggaaa aaccaatctg 360
 agaagaacaa cctaccttgt ccttgatgaa gcagatagaa tgcttgatat gggctttgaa 420
 ccccaaataa ggaagattgt ggatcaaata agacctgata ggcaaactct aatgtggagt 480
 gcgacttggc 490

<210> 127
 <211> 490
 <212> DNA
 <213> Homo sapien

<400> 127
 cgtggtcgcg gccgaggtcg gccgaggtct ggagatctga gaacgggcag actgcctcct 60
 caagtgggtc cctgaccctt gacccccgag cagcctaact gggaggcacc cccagcagg 120

37

```

ggcacactga cacctcacac ggcaggggtat tccaacagac ctgaagctga gggtcctgtc 180
tgtagaagg aaaactaaca agcagaaagg acagccacat caaaaaccca tctgtacatc 240
accatcatca aagacaaaaa gtaataaaaa ccacaaagat gggaaaaaaa cagaacagaa 300
aaactggaaa ctctaaaaag cagagcacct ctctcttcc aaaggaacgc agttcctcac 360
cagcaatgga acaaagctgg atggagaatg actttgacga gctgagaaaa gaacgcttca 420
gacgatcaaa ttactctgag ctacgggagg acattcaaac caaaggcaaa gaagttgaaa 480
actttgaaaa 490

```

```

<210> 128
<211> 469
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(469)
<223> n = A,T,C or G

```

```

<400> 128
cgtggtcgcg gccgaggtgc tttttttttt tttttttttt tttttttttt tgctgattta 60
ttttttctnt ttattgttac atacaatgta taaacacata aaacanaaaa cagtagggat 120
cctctaggat ctctagggan acagtaaagt anaaagaggc ctcanaaaaca tttttttaaa 180
gtacaagaca ttcagngctc ggcccaaagg cgtaaaaggc ttanagccag canatagctg 240
nactaaaggc tccgtctntn tccccanagc caggacaacc ccaggagagc ntccattagc 300
agccagtcca cgcaggcagg atgctgcgga aaaagctcta tgctganaac attccccttg 360
atggaaagaa gggcaacaca aaaggggtaa ctaanagctc ctctctctcg tgagggcgac 420
aactgaggaa cagaaaagga gtgtcccatg tcacttttga cccctccc 469

```

```

<210> 129
<211> 419
<212> DNA
<213> Homo sapien

```

```

<400> 129
gcgtggtcgc ggccgaggtc tgattttcat ttaaataattt cagagctata gcattttgcct 60
ccatgctcaa atccacacca ttggggctta agccgctcat gccaacatta gcaaatagaca 120
tgcagtttaa tccagagatc actgcttctg ggctgatgca tgccaacaca ctggcgatg 180
ccacgttatg tgcatttttc ttcactttag tgggagaatc aatttttact ccaaggcttc 240
ttagttgctt aagagttgca ttaaggacac aatctttgtc caccagtctt gaatgatgtg 300
tttttttctt tgtatggtaa acgttttggg ttctgggtgca ttcagtactg ataattactg 360
ctttggtaga cggctgctca agtttccttg gaggaactat ttaatagggtg gggtacttg 419

```

```

<210> 130
<211> 354
<212> DNA
<213> Homo sapien

```

```

<400> 130
agcgtggtcg cgcccgaggt ccatctgagg agataaccac atcactaaca aagtgggagc 60
gaccccgagc agcacgctgt ggaattccat agttgggtctc atccctgggc agtttccaca 120
tgatgatggt cttatctcga gaggcggaga ggatcatgtc cgggaactgc ggggtagtag 180
cgatctgggt taccagccg ttgtggccct tgaggggtgcc acgaaggggc atctgctcag 240
tcatggcggc ggcgagagcg tgtgtcgctg cagcgacgag gatggcactg gatggcttag 300
agaaactagc accacaacct ctctgcccgc acctgcccgg gcggcccgct cgaa 354

```

<210> 131
 <211> 474
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(474)
 <223> n = A,T,C or G

<400> 131
 cgagcggccg cccgggagc tctggcagca gcttcctctg gaataattga cagctttgtg 60
 ctgcctgact aaaatttgaa atgacaaccg ctgaatgtaa aatgatgtac ctacaatgag 120
 agagatttag gaatactatc tgtcaatcca tagatgtaga aacaaaacaa actacagaat 180
 gaaaacaaac ttatttttaa ccaaagaaac aaatgtatcc aaaatatagt ccatgatata 240
 tttgattact agtataacca cagttgaaaa cttaaaaaaa aaaattgaca ttttttgtaa 300
 tgggtactaa tggattata aaaggtttct gttcccaaag atgttattgg ggtccacata 360
 ttccctgaag acttcagcat cccaaagccc gacatcagag atactttcct ttagccattg 420
 nttcccgtaa cttgcccact ccatggtgat gtgacaggct tcccttcatt agca 474

<210> 132
 <211> 474
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(474)
 <223> n = A,T,C or G

<400> 132
 ggccgaggtg ggggaattcat gtggaggtca gagtggagc aggtgtgaga gggccagca 60
 gaaggaaaca tggctgccaa agtgtttgag tccattggca agtttggcct ggccttagct 120
 gttgcaggag gcgtggtgaa ctctgcctta tataatgtgg atgctgggca cagagctgtc 180
 atctttgacc gattccgtgg agtgcaggac attgtggtag ggggaaggac tcattttctc 240
 atcccgtggg tacagaaacc aattatcttt gactgccgtt ctgcaccacg taatgtgcca 300
 gtcacactg gtacaaaaga ttacagaat gtcaacatca cactgcgcac cctcttccgg 360
 cctgtcgcca gccagcttcc tcgcatcttc accagcatcg ganaggacta tgatgaaccg 420
 tgtgctgccg tccatcacaa ctgagatcct caagtcagtg gtggctcgct ttga 474

<210> 133
 <211> 387
 <212> DNA
 <213> Homo sapien

<400> 133
 tgctcgagcg gccgccagtg tgatggatat ctgcagaatt cggcttagcg tggctcgggc 60
 cgaggctctg gggccccctta gcctgccctg cttccaagcg acggccatcc cagtagggga 120
 ctttcccaca ctgtgccttt acgatcagcg tgacagagta gaagctggag tgcctcacca 180
 cacggccccg aaacagcggg aagtaactgg aaagagcttt aggacagctt agatgccgag 240
 tgggcgaatg ccagaccaat gatacccaga gctacctgcc gccaaacttg tgagatgtgt 300
 gtttgactgt gagagagtgt gtgtttgtgt gtgtgttttg ccatgaactg tggccccagt 360
 gtatagtgtt tcagtggggg agaactg 387

<210> 134

<211> 401
 <212> DNA
 <213> Homo sapien

<400> 134
 ggccgccccg gcaggtctga tgaagaacac ggggtgtgatc cttgccaatg acgccaatgc 60
 tgagcggctc aagagtgttg tgggcaactt gcatcggctg ggagtcacca acaccattat 120
 cagccactat gatgggcgcc agttcccca ggtgggtggg ggctttgacc gaggactgct 180
 ggatgctccc tgcagtggca ctggggtcat ctccaaggat ccagccgtga agactaacia 240
 ggatgagaag gacatcctgc gcttgtgctc acctccagaa ggaagttgct cctgagtgtc 300
 attgactctt gtcaatgcga ccttcaagac aggaggctac ctgggtttact gcacctgttc 360
 tatcacagtg agacctctgc catggcagaa caggggaagc t 401

<210> 135
 <211> 451
 <212> DNA
 <213> Homo sapien

<400> 135
 ggtcgcgccc gaggtctgtt cctgagaaca gcctgcattg gaatctacag agaggacaac 60
 taatgtgagt gaggaagtga ctgtatgttg actgtggaga aagtaagtca cgtgggcccct 120
 tgaggacctg gactgggtta ggaacagttg tactttcaga ggtgaggtgt cgagaaggga 180
 aagtgaatgt ggtctggagt gtgtccttgg ccttggctcc acaggggtgtg ctttcctctg 240
 gggcgcgtcag ggagctcctc ccttgtgttc tgccaggggtg gggtaaccggg gtttgacact 300
 gaggagggta acctgctggc tggagcggca gaacagtggc cttgatttgt cttttggaag 360
 attttaaaaa ccaaaaagca taaacattct ggtccttcac aatgctttct ctgaagaaat 420
 acttaacgga aggacttctc cattcaccat t 451

<210> 136
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 136
 ggccgccccg gcaggtctga atcacgtaga atttgaagat caagatgatg aagccagagt 60
 tcagtatgag ggttttcgac ctgggatgta tgtccgcgtt gagattgaaa atgttccttg 120
 tgaatttgtg cagaactttg acccccttta cccattatc ctgggtggct tgggcaacag 180
 tgagggaaat gttggacatg tgcaggtggg tccctttgct gcgtatttgg tgcctgaggc 240
 tctgtggatt tcccctccat caatcatctt accctctcat cccctcaga tgcgtctgaa 300
 gaaacatctc tggataaaga aaatcctcaa gtcccaagat ccaatcatat tttctgtagg 360
 gtggaggaag ttccagacca tcctgtctta ttatatccga agaccacaat g 411

<210> 137
 <211> 211
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(211)
 <223> n = A,T,C or G

<400> 137
 cggccgcccc ggcaggtcgg ttgggtgcggc ctccattgtt cgtgttttaa ggcgccatga 60
 ggggtgacag aggcctgtgt cgtgggtgggc gctttggttc cagaggaggc ccaggaggag 120

ggttcaggcc ctttgacca catatcccat ttgacttcta tttgtgtgaa atggcctttc 180
cccggntcaa gccagcacct cgatgaaact t 211

<210> 138
<211> 471
<212> DNA
<213> Homo sapien

<400> 138
gccgccccggg caggtctggg ctggcgactg gcacccaggc cgtaactgca aatctatgct 60
aggcgggggtc tcccttctgt gtgttcaagt gttctcgact tggattctta actattttta 120
aaaatgcact gagtttgggt taaaaaccaa ccaccaaagt ggatttcaac acagctctaa 180
agccaagggc gtggccggct ctcccaacac agcgactcct ggaggccagg tgcccatggg 240
cctacatccc ctctcagcac tgaacagtga gttgattttt ctttttacia taaaaaaagc 300
tgagtaatat tgcataggag taccaagaaa ctgcctcatt ggaaacaaaa actattttaca 360
ttaaataaaa agcctggccg caggtctgct ctgccacatt tacagcacgg tgcgatgcac 420
acggtgacca aaccacggag gcaagcttct ggcactcaca ccacgacccg c 471

<210> 139
<211> 481
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(481)
<223> n = A,T,C or G

<400> 139
gtcggggccg aggtctgttc tttagctcag atttaaacct gctgtctctt ctttattttgc 60
agaatgaatt cccagttcct gagcagttca agaccctatg gaacggggcag aagttgggtca 120
ccacagtgcac agaaattgct ggataagcga agtgccactg ggttcttttg cctcccttca 180
caccatggga taaatctgta tcaagacggg tcttttctag atttccctta cctttttgct 240
cttaaaactg cttctctgct ctgagaagca cagctacctg ccttcactga aatatacctc 300
aggtctgaaat ttgggggtgg atagcaggct agttgatctt ctgcaggaag gtgcagcttt 360
tccatatcag ctcaaccacg ccgncagtc attcttaagg aactgccgac taggactgat 420
gatgcatttt agcttttgag cttttggggg gtattctacc aaccaacagt ccatttgga 480
a 481

<210> 140
<211> 421
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(421)
<223> n = A,T,C or G

<400> 140
gtcggggccg aggtttccca ttttaagaaaa atagatcttg agattctgat tcttttccaa 60
acagtcacct gctttcatgt acagcttttt ctttacctta cccaaaattc tggccttgaa 120
gcagttttcc tctatggctt tgctttctg attttctcag aggtctgagt ctttaataata 180
accccaaatg aaagaaccaa ggggaggggt gggatggcac ttttttttgt tggctctgtt 240
ttgttttgtt ttttggttgg ttgggttccg ttatttttta agattagcca ttctctgctg 300

41

```

ctatttccct acataatgtc aatttttaac cataattttg acatgattga gatgtacttg 360
aggctttttt gntttaattg agaaaagact ttgcaatttt ttttttagga tgagcctctc 420
c 421

```

```

<210> 141
<211> 242
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(242)
<223> n = A,T,C or G

```

```

<400> 141
cgantngccc gcccgggcan gtctgtctaa nttntcang gaccacgaac agaaactcgt 60
gcttcaccga anaacaatat cttaaaccac gaanaattta aatattatga aaaaaaacat 120
tgcaaaatat aaaataaata nnaaaaggaa aggaaacttt gaaccttatg taccgagcaa 180
atccaggtct agcaaacagt gctagtccta nattacttga tntacaacaa cacatgaata 240
ca 242

```

```

<210> 142
<211> 551
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(551)
<223> n = A,T,C or G

```

```

<400> 142
agcgtggtcg cggcncgang tccacagggc anatattctt ttagtgtctg gaattaaaat 60
gtttgaggtt tangtttgcc attgtctttc caaaaggcca aataattcan atgtaaccac 120
accaagtgca aacctgtgct ttctatttca cgtactgttg tccatacagt tctaaataca 180
tgtgcagggg attgtagcta atgcattaca cagtcgttca gtcttctctg cagacacact 240
aagtgatcat accaacgtgt tatacactca actagaanat aataagcttt aatctgaggg 300
caagtacagt cctgacaaaa gggcaagtgt gcataataga tcttcgatca attctctctc 360
caaggggccc gcaactaggc tattattcat aaaacacaac tgaanagggg attggtttta 420
ctggtaaatc atgtgntgct aaatcatttt ctgaacagtg gggctctaat cantcattga 480
tttagtggca gccacctgcc cggcgggccgn tcgaagccca attctgcaga tatccatcac 540
actggcggcc g 551

```

```

<210> 143
<211> 515
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(515)
<223> n = A,T,C or G

```

```

<400> 143
cgagngggccc gcccgggcag gtatcttcac aaactcaaca aaggcactac atgagacttc 60

```

```

acattccctt agtccaatag ctgacaaaatt tttgcaacgt tctgcaatgc gaattaactc 120
ttcatcaagt ggccgtaatc catttgcaca cactactagt tcaaccagtc tagggcatgt 180
cattcccaca cggccaagca catctttgct tactgatctc ccaaagtaca gatgggtggc 240
aggtatttca tagcgaaaga aggggtcaaa ttcttcttca tataanaaaaa aatacatcac 300
taagttcact ttgggtgaat gtctgatgaa agcatcccag ctactcttct gaatagtatg 360
gaagtgtgtc tgtccaggat tctcactgac tacatcaatg cgcaaatgtt ctaatcgaac 420
atgtttttca gaagacaatg caagtaacaa ctcatcactc aataagtggg aagttcaggg 480
ctagttctct taagccgnga cactgatcag cacac 515

```

```

<210> 144
<211> 247
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(247)
<223> n = A,T,C or G

```

```

<400> 144
tgcattctct ntggatgcan acctgcccgt tggtagggac tntgctcaca cggaacatgg 60
acggttacac ctgtgccgtg ggtgacgtcc accagcttct ggatcatctc ggcgnnggtg 120
ttgtggaagg gcagactatc cacctccatg cncacgatgc ccganacgcc actccggact 180
ntgtgctgca ccaanatgcc cagcattnta tcttcaagca nagcacttat caggggtcctt 240
ggcacac 247

```

```

<210> 145
<211> 309
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(309)
<223> n = A,T,C or G

```

```

<400> 145
cgtgggtcgc ggcccangt ctgctgtaac aaaacaccat agtctgggca gctcatagac 60
aatggaattt tatttctcac gcttctggag gctggattcc aagatcaagg ttccaggaga 120
ctcagtgtct ggcaaggctc cggtttctgc ctcanagatg gtgccatctg gctgtgtcct 180
cacaagtagg aaggtgcaag aagctcccct caggctctgt ctgtaagaca ctgatcccat 240
tcatganguu gaaacgtaat gacctaatca gccccagag accccacttc taacaccatc 300
accttgggg 309

```

```

<210> 146
<211> 486
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(486)
<223> n = A,T,C or G

```

```

<400> 146

```

```

agcgtggggtc gcggcncgac gtccgtgtcca tatttcacag cccgagaact aatacaagat      60
gctgacatca tattttgtcc ctacaactat cttctanatg cacaaataag ggaaagtatg      120
gatttaaatec tgaaagaaca ggttggtcatt ttanatgaag ctcataacat cgaggactgt      180
gctcgggaat cagcaagtta cagtgttaaca gaagttcagc ttcgggtttgc tcgggatgaa      240
ctanatagta tgggtcaacaa taatataagg aaganagatc atgaaccctc acgagctgtg      300
tgctgtagcc tcattaattg gntagaagca aacgctgaat atcttgnana angagantat      360
gaatcagctt gtaaaatatg gagtggaaat gaaatgctct taactttaca caaaatgggt      420
atcaccactg ctacttttcc cattttgcng gtaagatatn ttttctacct gngaaacgta      480
ttaag                                           486

```

<210> 147

<211> 430

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(430)

<223> n = A,T,C or G

<400> 147

```

gccgcccggg cangttcgac attacntnga gttccatgat gtacaattct ttcacgaaaa      60
acaatgaatg caagaatttg aggatctcct tactcctccc ttttacagat ggtctctcaa      120
tccttcttcc ttcctcttca tcttcattct cttctgaacg cgctgccggg taccacgggt      180
ttctttgtct ttatcgtgag atgaagggtga tgcttctgtt tcttctacca taactgaaga      240
aatttcgctg caagtctctt gactggctgt ttctccgact tcgctttnt gtcaaacgng      300
agtcttttta cctcatgccc ctacgcttca cagcatcttc atctggatgt tnatttctca      360
aagggctcac tgaggaaact tctgattcan atgtcgaana gcactgtgaa gttttctctt      420
cattttgctg                                           430

```

<210> 148

<211> 483

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(483)

<223> n = A,T,C or G

<400> 148

```

cccgggcagg tctgtgttgn tttncaccg gtgtcctccc cagcgtccag aananggaaa      60
tgtggagcgg gtgatgatga cccctcgctg tcctgtcacc tcctgcacag cttcgtatgt      120
gggtctggct tgggaccacc cgtacaggtt gtgcacgttg tagtgctcca cgggggagct      180
gtccggcagg atctgctgac tctccatgca cagagtcttg ctgctcaggc ccttgctcct      240
agattccaaa tatggcatat aggggtgggt tatttagcat ttcatgtctg cagccctga      300
cagatccatc cacaaaattt gatggctcat tcatatcaat ccacaatcca tcaaacttca      360
agctcttctc tggntctcga nggtttgcat agaactcttc tatctcttcc ttcaccacg      420
canacctcgg ncgcgaccac gctaagccga attctgcana tatccatcac actggcgggc      480
gct                                           483

```

<210> 149

<211> 439

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(439)
 <223> n = A,T,C or G

<400> 149
 ctttcacgaa nacaatgaat gcaagaattt gaggatctcc ttactcctcc cttttacaga 60
 tggctctctca atcccttctt ctccctcttc atcttcatct tcttctgaac gcgctgccgg 120
 gtaccacggc tttctttgtc tttatcgtga gatgaagggtg atgcttctgt ttcttctacc 180
 ataaatgaag aaatttcgct gcaagtctct tgactggctg tttctccgac ttccgctttt 240
 tgcaaacgtg agtcttttta cctcatgccc ctccagcttcc acagcatctt catctggatg 300
 ttcatctctc aaagggtcca ctgaggaaac ttctgactca catgtcgaag aagcactgng 360
 agtttctctt catttgctgc aaanttgctc tttgctggct gngctctcag accacccatt 420
 tggctgcatg ggggctgac 439

<210> 150
 <211> 578
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(578)
 <223> n = A,T,C or G

<400> 150
 ggcncgcccc ggcangtcca ctccactttt gagctctgag ggaatacctt caggagggag 60
 agggtcaggg agtccctggca gctccgcagc agagattcac attcattcag agacttggtg 120
 tccagtgcaa tgccattgat cgcaacgatc ctgtctccca cagcaaggga cccttcttta 180
 gcggcagggc ttccaggcag cacagcggca gcatacactc cattctccag actgatgcca 240
 ctgtctttct gtccactgan gttgatgtgc agcggcgctga ccaccttccc acccagggag 300
 ttccctccgc gcacgaccat gttgatgggc cccctnccca ttgaggagcg ccttgatggc 360
 ctgcttcttg nccttggtga tgaagtccac atcggtgatt ctccacagcca gtcattgacc 420
 cttaagcggg catcagcaat gcttcccttg gccactttag ngacaaatat gccacagtcc 480
 ccgggaaaca agggtcattc acaccttctg gcataatcaa cacctcggcc ggganacta 540
 agccgaattc tgcagatatt catcacactg gngggcgc 578

<210> 151
 <211> 503
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(503)
 <223> n = A,T,C or G

<400> 151
 cgagcggccc gcccgggcag gtctgggaga tcagcgactg ctgccacgtg cccagaaatg 60
 gtcgtctctt tctactacagc ggaatgcaat gagggtgggt gagaagatga tgggtcggtt 120
 atttcattcc ttttcttttt acaacttcac tttcagagac ttccagcgtt catgtctgct 180
 gtgctgtgga acccagagtg ctcttgccctg gatggctgag aatcccttgg accctggaag 240
 cacctactcc atgatggccc ggtatagtgc aggtcaata taatcttccc ggtatcttga 300
 gttgataact cgttgccgtt tcttttcttg cttaacctct ttctctgtga aaatctcatt 360

45

```

gaagcgcacg tctgaagcta ctgacagtct anatttgact ctcttgggaa gctcttcac 420
cagtgtgtat acatcatctc tcttaaccac aagttggagc catncttaaa cttcacctgg 480
tacatttggg taggggtggg ggc 503

```

```

<210> 152
<211> 553
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (553)
<223> n = A,T,C or G

```

```

<400> 152
agcgtgggtcg cggcccagagg tccactgagc tccgccttcc ccgggctccc tgaggaagca 60
gagtcctgac ttccaggaag gacaggacac agaggcaaga actcagcctg tgaggctctg 120
ggtggctcct gaggccagag gacgccttcc gcgatccatg gctcagcatc gtccttctgg 180
cttcccagcc ccgggccgaa cggttcgggtt aataagcaga gcagttattc ggctcctggc 240
aggagctccc ccgttagttt ccacgttggtg agcacattca tacttaagac tgnctctctt 300
tgtgttttaa gcgctctgtct ctgtagtaaa ctgaaatgtt aacagaaatg cagacctgcc 360
cgggcggccg ctcgaaagcc gaattctgca gatatccatc acactggcgg ccgctcgagc 420
atgcatctag anggcccaat tcgcccata gtgagtcgna ttacaattca ctgggccggc 480
ntttacaacg tcgtgactgg gaaaacctg cggtaccac ttaatcgct tgcagnacat 540
ccccctttcg cca 553

```

```

<210> 153
<211> 454
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (454)
<223> n = A,T,C or G

```

```

<400> 153
tcgagcggct cggccgggca ggtccaccta gcatgggtcc tctaaacacg caactcagcg 60
aggggacccc cttcacctct ggcaagagag ctgggtagat cagaaacttg gtgacacctg 120
gctagcacag agcaggctca cttgtcttgg tccactacc cagattcctg cagacattgc 180
aaaccaaagt aaggttgntg aatgacctct gtccccagcc acttgttttg gtatcatctg 240
ctctgcagtg gaatgcctgt gtgtttgagt tcaactctgca tctgtatatt tgagtataga 300
aaccgantca agtgatctgt gcatncagac acactggggc acctgancac agaacaatc 360
accttaacga tctggaatga aactgnganc antgcccggc tgggtgggtc tgganaaact 420
gccgncttct tgttggacct tggccgcacc acct 454

```

```

<210> 154
<211> 596
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (596)
<223> n = A,T,C or G

```

<400> 154
 agcgtgggtcg cggccccgang gcggcctcct gantganggg aagggacgtg ggggaggcca 60
 cggcaggatt aacctccatt tcagctaatac atgggagaga ttaaagtctc tcctgattat 120
 aactggttta naggtacagt tccccctaaa aagattattg tggatgatga tgacagtaag 180
 atatggtcgc tctatgacgc gggcccccca agtatcaggt gtctctcat attcctgccc 240
 cctgtcagtg gaactgcaga tgtctttttc cggcagattt tggctctgac tggatggggt 300
 taccgggtta tcgctttgca gtatccagtt tattgggacc atctcgagtt ctgtgatgg 360
 attcacaaaa cttttanacc atttacaatt ggataaagtt catctttttg gcgcttcttt 420
 gggangcttt ttggcccana aatttgctga atacactcac aaatctccta gaagccattc 480
 cctaattctc tgcaattcct tcagngacac ctctatcttc aaccaacttg gactggaaac 540
 agctttggct gatgcctgca tttatgctca aaaaatagtt cttggaaatt ttcac 596

<210> 155
 <211> 343
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(343)
 <223> n = A,T,C or G

<400> 155
 ctcganttg cncgccccggg cangtctgcc tggtttttga ccgngcgagc tatttagtct 60
 ctggctctgt ttccggagct caaggnaaaa atcttgaana actcgagcag cttctgtgga 120
 tagccttggg tacacatact gccgagcata gccaatgtac tttctcaata gctggtgggg 180
 aatgggatct attgtttctc caggaaccac ctttagtctt tctgataatg gcttctcaga 240
 aactacttca agtacggaag tatttgaatc ttgactatnc atacgagcta ctgtggcact 300
 gctaattgggn tctctgctnt ccagctctta ttgcaatcac atg 343

<210> 156
 <211> 556
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1)...(556)
 <223> n = A,T,C or G

<400> 156
 tcgagcggcc cgccccgggca ggtctggcac cacncagatc gattaactgg ctcatctgat 60
 ctcgaggccc ccaccctgga actgacttag cacaaaagga cacctcaatt ccttatgatt 120
 tcatctccga cccaaccaat caacaccctt gactcactgg ccttccccct cccaccaa 180
 tatccttaaa aactctgac cccgaatgct caggggagatc gatttgagta ctaataagac 240
 tccagtctcc tgcacaagca gctctgtgta ctcttctctt attgcaattc ctgtcttgat 300
 aaatcggctc tgtgtaggcg gcggaagaag tgaacctgtt gggcggttac cacctctgtc 360
 gtgtgtgaca gttgntttga atctctaatt gctcagtaca gatccacatg cagggttaagt 420
 aagaagcttt tgaagaaaat ggaaagtctt aagtgatggc ttccaagaaa tcaaacctac 480
 attaattagg gaacaacgga ctttacgtat cacaaatgaa gagactgacn aagtaaataca 540
 acttggcctt ttctta 556

<210> 157
 <211> 333

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(333)
<223> n = A,T,C or G

<400> 157
gggtccacaaa aatatatnaa ataagctgga tatataaaan caaacactta acatngncan 60
cattccttca gttattcaaa ctccactgata nctaacnggg agnagttggn attctggaag 120
acttcctaag taaaaagtat atttacatat ttacaacaca ngtaaatata acngaagaac 180
tacttcaaat aangnngaaa ttccagaatt ctanagattt atagctatag ntnacaanta 240
tcaccaattg gtttgcaatc aanngnccag cactacttat gannaangtt taactannaa 300
accaaaaggg gagaaaacct ggnagggaana nat 333

<210> 158
<211> 629
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(629)
<223> n = A,T,C or G

<400> 158
tcgagcgggcc gcccgggcag gtctggtaca tttgtgagag gtccggcact ctgtttctcat 60
ccagtaagtg gtcgagccct ttctgcagaa ttgctgttaa atgtttctct aatagctggt 120
tctccacaca agcaatcagt ggttttctgtg tgcgtgtggtc caagtaagtg attactctgt 180
ctccctcttc ttctaagcgt ttacttacat ggtaagata ttctggaacc tctctttcct 240
gcattaacct ttggccttcg gcagcatata agcaattagt ctcttccaaa aatttcagtt 300
caaatgaatc ttatataacc tgcaggctcag acagcatgcc cagggnaggct ccgcaacagg 360
ctccgggtcca cggcctcgcc gctcctctcg cgctcgatca gcagtaggat tccatcaatg 420
gttttactct gaaccatttt atcactaata atatgggttc taaacagttc taatcccata 480
tcccagatgg agggcagcgt ggagttctgc agcacatagg tgcgggtcca gaacaggaag 540
atgcttctga tcatgaatca ttgntctggc aatgggtctg ccagcacgtg gtaatctttc 600
ttttaaaaat aaacccttat ctaaaccgtc 629

<210> 159
<211> 629
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(629)
<223> n = A,T,C or G

<400> 159
tcgagcgggcc gcccgggcag gttctagagg ganaatctgg ctgatttggg aataaaaatat 60
aatcgaaat tcaacacat gaagataaat cttatttttg aaatctactg accttaatac 120
cccaagcttg ccttgaatac ttgtattgga attggaatat atcaaaaaag gttagtattt 180
ttgtttagt taggatacta aaaggatatt agttaccaa gagatccaat ttgtttttct 240
gatgaatagt gttcagtaaa atgaagcagt ctttaagagt actaataatt tcaaagtgat 300

```

ttttcgctcta ttcttaatat tttttaatta tttattttta agagttttat accttgagca 360
gatacaatga tccgcttttag tgagaggaca atttctgatt gattgttttc tcttcaggcc 420
atctcacctc ttcattctct tgttacatit gaagcagttg atataatggg tttatacttt 480
aaaagataga catggtgcca tgaagtttgg ggaagttggg tgaattatcc cattctagtt 540
acagangagc tttccttaaa tgccctttac ttctangttt ggtcaagaag tcattttctg 600
agtaaaagtt attttcatat atgttgggg 629

```

```

<210> 160
<211> 519
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1)...(519)
<223> n = A,T,C or G

```

```

<400> 160
tcgagcggcg cgcccgggca ggtctgctgg gattaatgcc aagttnttca gccataaggt 60
agcgaaatct agcagaatcc agattacatc cacttccaat cacgcggtgt ttgggtaatc 120
cacttagttt ccagataaca tacgtaagaa tgtccactgg gttggaaacc acaattatga 180
tgcaatcagg actgtacttg acgatctgag gaataatgaa tttgaagaca ttaacatttc 240
tctgcaccag attgagccga ctctccctt cttgctgacg gactcctgca gttaccacta 300
caatcttana attggggcggg tcacagaata atctttatct gccacaattt taggtgctga 360
agaaataagc tcccatgctg cagatccatc atttctnctt taagcttate ttccaaaaca 420
tccacaagan caangttcat cagccagaga ctttcccaga atgctgatag nacacgccat 480
accaacttgt ccaacancca ctacagcgat cttattggg 519

```

```

<210> 161
<211> 446
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(446)
<223> n = A,T,C or G

```

```

<400> 161
cgagngggccc gcccgggcag gtccagtaag cntttnacga tgatgggaaa ggttatgcaa 60
ggtcccagcg gtacaacgag ctgtttctac atcatttgta ttctgcatgg tacgtacaat 120
agcagacacc atctgaggag aacgcatgat agcgtgtctg gaagcttcct ttttagaaag 180
ctgatggacc ataactgcag ccttattaac caccacctgg tcctcgatcat ttagcagttt 240
tgtcagttca gggattgcac gtgtggcang ttctgcatca tcttgatagt taatcaagtt 300
tacaactggc atgtttcagc atctgcgatg ggctcagcaa acgctggaca ttantgggat 360
gagcagcatc aaactgtgta natgggatct gcatgccctc atctaattgtc tcagggaaca 420
tagcagctcg taccctctga gctcga 446

```

```

<210> 162
<211> 354
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature

```

<222> (1)...(354)

<223> n = A,T,C or G

<400> 162

agcgtngtcg	cgccccgang	tccctgggaag	cctttnttgc	tgagcctcac	agcctctgtc	60
aggcggtctg	ggatccagcg	gtccaccagg	ctctcatggc	ctccgggctg	ggaggngggg	120
gagggcacaa	aacccttccc	aaggccacga	anggcaaact	tggtggcatt	ccanagcttg	180
ttgcanaagt	ggcggnnaacc	cagtatccgg	ttcacatcca	ggntgatgtc	acgaccttgg	240
gacatgtang	cacataatcc	aaaccggaga	gcacgggtgc	cacattcacg	aatccccgct	300
gggaagtcag	ctttctgccc	ttctttggcc	ttctccacct	cgctgggatc	cagg	354

<210> 163

<211> 258

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(258)

<223> n = A,T,C or G

<400> 163

tttttcncca	agtcctcttg	ccgnggggatc	tngactgcaa	tttaagacac	ttctaattag	60
ttataccag	gccctgcaaa	attgctgggt	ttatataata	tattcttgct	gcacgaagat	120
ttattattct	gttggatgat	tctattttta	ttntatttat	tctggccaaa	aaagaacctt	180
ctccgctcgt	caagagangc	caatntgtct	tgaaggacaa	gagaaagatg	ctaacacaca	240
ctttcttctt	cttgagga					258

<210> 164

<211> 282

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(282)

<223> n = A,T,C or G

<400> 164

ggaacatatt	actttttaa	tacttgggtc	aatgaaacat	ttaataaaaa	catttgcttc	60
tctatataat	acgtatgtat	aaaataagcc	ttttcanaaa	ctctggttct	cataatcctc	120
tataaatcan	atgatctgac	ttctaagagg	aacaaattac	agnaaggggt	atacattnat	180
gaatactggt	agtactagag	ganngacgct	aaaccactct	actaccactt	gcggaactct	240
cacagggtaa	atgacaaagc	caatgactga	ctctaaaaac	aa		282

<210> 165

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(462)

<223> n = A,T,C or G

<400> 165
 gccccgggcan gtcctgtaat cccagctact canganctg agtcctgana atcgccctgaa 60
 tccgggaggt agaggccgca gcgagcaaag attaaagccac tgcactccag tctgggtgac 120
 agagtgagaa tctgtctgtt gctcctcttg cattgggtctg aaatgggttt gtagaacatg 180
 ccacagaagg accagcanca gcaacaaatg gatttgtgga ancgtagct ccaaattggag 240
 cangcacact tgatgaagca cgctgtgtct gtgcagangc aaccactggc actgttccaa 300
 aaacattgct gctagcatta cttgtggaag tatacgcat actggagggtg gctgcanaac 360
 tgaaaacgct gtctagtctt gccanagctg catacttgnc tgaanatgca cttgactgac 420
 tgggaactga accacanaac caacaggacc ttacctgtg ga 462

<210> 166

<211> 365

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(365)

<223> n = A,T,C or G

<400> 166
 cgtgggtcgc ggcncgangt ctgaaaccaa tccagaacta aacatcagca cacaaaaaat 60
 accaggatag atggaatcaa aagactctga agccaaaagg aggctaggga gagcaactga 120
 acttagcaag ctgaggactt cagtgtccat catccgatcc tgcctgttaa caacaggtct 180
 atatgataga gatattccat ctgagctgga ggccattatc cttagcaaac taacacagaa 240
 cagaaaacca aatacatgtt ctcatttaga agtaggagct aaatgatgag aactcaagga 300
 cacaaagaaa ggaacaacag aactggggc ctacttgagg gtggagggtg ggaggaggga 360
 gaaga 365

<210> 167

<211> 364

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(364)

<223> n = A,T,C or G

<400> 167
 agcgtggtcg cggcgcgang tccagcccta gcttgccctg gactccgcct tcactgggtg 60
 ctctctctaa aagttgctga ctctttactg tatctcccaa ttccactcc attggttcca 120
 taaggggagg ggtgtctcac tcaacatggt gtctctggta ccaagaactg gctgacgaag 180
 ctgggtgccg tggctcatgc ctgtaatccc agcacttttg ggaggccaag aagggcgat 240
 cacctgaggt ctggagttca agatcagcct gaccaacatg atgaaaccaa gtctccacta 300
 aaaatataaa acaattagcc aggcatggtg gtgggtgcct gnaatcccag ctactggggga 360
 ngct 364

<210> 168

<211> 447

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(447)

<223> n = A,T,C or G

<400> 168

cccgggcagg tcaaaaccca aaacctttca ttttagccca aaccagctca tgattaggta	60
tacaaggata acagaaccag ttgtcaggac gagcatttga caagtaaaag caattccttg	120
aaagctgcag ttcattccagc tcatggcatg tgtctttata tagcatcctc gcaatgtcag	180
cttgctcact gtctgtctcca tagaaaatca cgggtatttg gagaagcaat tgggcatcag	240
ctttgaactc ttcataactt cgggtatttcc cttcattcac tttctcttga atgggtgggaa	300
cgtccacaga cctcggccgc gaccacgcta agcccgaatt ctgcagatat ccatcacact	360
ggcggccggt cgagcatggc atctagaagg cccaattcgc ctatagngag tcgnattacc	420
aattcactgg ccgtcgnntt acaacgc	447

<210> 169

<211> 524

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(524)

<223> n = A,T,C or G

<400> 169

cgantngcgc gcccgggcag gtctgagcag cctttctggn tgctggacta ttgggattgg	60
gttcatccaa cagagactgt atggatgtta gaatggaaga cacatcatag gttggactcc	120
aacggttctg aagtatgtcc agacatatac taccatctgc atagactaag aacaaagaag	180
taggtacatt aaacgtaaca agaccactaa ggttttaaca ttatagacaa aacanaaata	240
gtcaaganta ctttgctttt gaagttaaaa gattcctatg ttgcttccca gtttaactgcc	300
taaaaagata agncataacc accactagtg aaataatcan gatgatcaga gaatgtcana	360
tgtgatcagt ataaaactgg angatattna gtgtcatcct ttggaaaagg ctgccctatn	420
atccaggaaa tcanaaacat tnttgaacag ggnccctagc tatccacaga catgtgggaa	480
attcattccc caaatngtag gctggatccc ctatctgaaa taac	524

<210> 170

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(332)

<223> n = A,T,C or G

<400> 170

tcgancggcn cgcccgggca ggtgacaaac ctgttattga agatgttggt tctgatgagg	60
aanaanatca gaagggatgg tgacaagaan aanaanaaga agattaagga aaagtacatc	120
gatcaagaag agctcaaca aacaaagccc atctggacca gaaatcccga cgatattact	180
aatgangagt acggagaatt ctataanagc ttgaccaatg actgggaaga tcacttggca	240
gtgaagcatt tttcagttga nggacagttg gaattcagag cccttctatn tgtcccacga	300
cgtgctcctt ttgatctgtt tganancaga aa	332

<210> 171

<211> 334

<212> DNA

52

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(334)

<223> n = A,T,C or G

<400> 171

cgagnggcnc gcccgggcag gtctgttgat agcgacttaa cagaaaagtc tagacaaaca	60
taagcataaa aaattacagt ctttctaccc ttgggaatgg ggagaaaaag gaatctctac	120
cccaagacca gaaataataa gtccgtgttc tggctctgaa catccagaat tatggaggct	180
ttggcctgac accacattan aatttgggtc ggaaatcaaa ctttaganac angagatcgt	240
aagccatttt atactatcga cctaaattcc agtctaacgg ttcctttaca aagttgcgga	300
aagccctctt atatgctagc tgtaggaaat atag	334

<210> 172

<211> 439

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(439)

<223> n = A,T,C or G

<400> 172

agcgtgggtcg cggcccgang tctgcctata aaactagact tctgacgctg ggctccagct	60
tcattctcac aggtcatcat cctcatccgg gagagcagtt gtctgagcaa cctctaagtc	120
gtgctcatatc tgtgctgcc aagctgggtc catgacaact tctgggtggg cgagagcagg	180
catggcaaca aattccaagt tagggctccc aatgagcttc cttagcaagcc agaggaaggg	240
cttttcaaag ttgtagttac ttttggcaga aatgtcgtag tactgaagat tcttctttcg	300
gtggaagaca atggatttcg ccttcacttt ctgccttaat atccactttg gtgccacaca	360
acacaatggg gatgntttca cacacttngn accanatctc tatgccagnt aggccatttt	420
ggaagnactt cganggtac	439

<210> 173

<211> 599

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(599)

<223> n = A,T,C or G

<400> 173

cgatnggccg cccgggagcgc tctgtgtaaaa naggaaattc agacatcgta cgactcgtaa	60
ttgaatgtgg agctgactgc aatattttgt caaagcacca gaatagtgcc ctgcactttg	120
cgaagcagtc taacaatgtg cttgtgtacg acttgctgaa gaaccattta gagacacttt	180
caagagtagc agaagagaca ataaaggatt actttgaagc tgcgcttgct ctgctagaac	240
cagtttttcc aatcgcatgt catcgactct gtgaggggtcc agatttttca acagatttca	300
attaccaacc cccacagaac ataccagaag gctctggcat cctgctgttt atcttccatg	360
caaaactttt gggtaaaagaa gttattgtc ggctctgtgg accgtgtagt gtacaagctg	420
tagttctgaa tgataaattt cagcttcctg ttttctctgg tctcgctctg ttgtccaggc	480
tggagtgcag tggcgcggtac tacagctcac tggagtcttg acttcccagg cacaagcaat	540

cctccccacct cagcctccta actacctggg actaaaaatg caccgccacc acattccgg 599

<210> 174

<211> 458

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(458)

<223> n = A,T,C or G

<400> 174

tcgatttggc	cgcccgggca	ggtccatgcn	gnttntgccc	attcccatgg	ngcccgacaa	60
ncccatcccc	gaggccgaca	tccccatgtt	catgttcatg	cccaccatgc	cctgggtcat	120
ccctgcgctg	ttccccagag	gggccattcc	catggtgccc	gtcattacac	cgggcatgtt	180
cataggcatg	ggtcccccca	ggagagggtt	agnttgaggc	cggacaggaa	gcatgtttga	240
tggagaactg	aggttcacag	ntcccaaac	tttgagtcac	cacattcata	ggctgctgca	300
tattctgtct	gctgaatcca	ttgtatncag	tgatggcctg	ctggggnttt	ggaaggctng	360
cataccaggt	agtaagntcg	tctaggctga	tgtttacacc	tggggtcaga	ccaagtanga	420
gggcaagggt	ttgctgactg	attttctgga	cccatatc			458

<210> 175

<211> 1206

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagga	agtttttgtg	actgaaaaag	aaactgtcag	aagcaaaaaga	aataaaatca	60
cagttagaga	accaaaaagt	taaatgggaa	caagagctct	gcagtgtgag	gtttctcaca	120
ctcatgaaaa	tgaaaattat	ctcttacatg	aaaattgcat	gttgaaaaag	gaaattgccca	180
tgctaaaact	ggaaatagcc	acactgaaac	accaatacca	ggaaaaggaa	aataaatact	240
ttgaggacat	taagatttta	aaagaaaaga	atgctgaact	tcagatgacc	ctaaaactga	300
aagaggaatc	attaactaaa	agggcatctc	aatatagtgg	gcagcttaa	gttctgatag	360
ctgagaacac	aatgctcact	tctaaattga	aggaaaaaca	agacaaagaa	atactagagg	420
cagaaaattga	atcacaccat	cctagactgg	cttctgctgt	acaagaccat	gatcaaattg	480
tgacatcaag	aaaaagtcaa	gaacctgctt	tccacattgc	aggagatgct	tgtttgcaaa	540
gaaaaatgaa	tgttgatgtg	agtagtacga	tatataacaa	tgagggtgct	catcaaccac	600
tttctgaagc	tcaaaggaaa	tccaaaagcc	taaaaattaa	tctcaattat	gccggagatg	660
ctctaagaga	aaatacattg	gtttcagaac	atgcacaaag	agaccaacgt	gaaacacagt	720
gtcaaatgaa	ggaagctgaa	cacatgtatc	aaaacgaaca	agataatgtg	aacaaacaca	780
ctgaacagca	ggagtctcta	gatcagaaat	tatttcaact	acaaagcaaa	aatatgtggc	840
ttcaacagca	attagttcat	gcacataaga	aagctgacaa	caaaagcaag	ataacaattg	900
atattcattt	tcttgagagg	aaaatgcaac	atcatctcct	aaaagagaaa	aatgaggaga	960
tatttaatta	caataacat	ttaaaaaacc	gtatatatca	atatgaaaaa	gagaaagcag	1020
aaacagaagt	tatataatag	tataacactg	ccaaggagcg	gattatctca	tcttcacct	1080
gtaattccag	tgtttgtcag	gtggttggtg	aataaatgaa	taaagaatga	gaaaaccaga	1140
agctctgata	cataatcata	atgataatta	tttcaatgca	caactacggg	tggtgctgct	1200
cgtgcc						1206

<210> 176

<211> 317

<212> PRT

<213> Homo sapien

54

<400> 176
 Met Gly Thr Arg Ala Leu Gln Cys Glu Val Ser His Thr His Glu Asn
 1 5 10 15
 Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys Glu Ile Ala
 20 25 30
 Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr Gln Glu Lys
 35 40 45
 Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu Lys Asn Ala
 50 55 60
 Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu Thr Lys Arg
 65 70 75 80
 Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala Glu Asn Thr
 85 90 95
 Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu Ile Leu Glu
 100 105 110
 Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala Val Gln Asp
 115 120 125
 His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro Ala Phe His
 130 135 140
 Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val Asp Val Ser
 145 150 155 160
 Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu Ser Glu Ala
 165 170 175
 Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr Ala Gly Asp
 180 185 190
 Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln Arg Asp Gln
 195 200 205
 Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met Tyr Gln Asn
 210 215 220
 Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu Ser Leu Asp
 225 230 235 240
 Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu Gln Gln Gln
 245 250 255
 Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys Ile Thr Ile
 260 265 270
 Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu Leu Lys Glu
 275 280 285
 Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys Asn Arg Ile
 290 295 300
 Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Val Ile
 305 310 315

<210> 177
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Made in the Lab

<400> 177
 ccaatcatct ccacaggagc

20

<210> 178
 <211> 1665

<212> DNA

<213> Homo sapien

<400> 178

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gcaaaactttc aagcagagcc tcccgagaag ccatctgect tcgagcctgc cattgaaatg      60
caaaagtctg ttccaaataa agccttggaa ttgaagaatg aacaaacatt gagagcagat      120
cagatgttcc cttcagaatc aaaacaaaag aaggttgaag aaaattcttg ggattctgag      180
agtctccgtg agactgtttc acagaaggat gtgtgtgtac ccaaggctac acatcaaaaa      240
gaaatggata aaataagtgg aaaattagaa gattcaacta gcctatcaaa aatcttggat      300
acagttcatt cttgtgaaag agcaagggaa cttcaaaaag atcactgtga acaacgtaca      360
ggaaaaatgg aacaaatgaa aaagaagttt tgtgtactga aaaagaaact gtcagaagca      420
aaagaaataa aatcacagtt agagaaccaa aaagttaaat ggggaacaaga gctctgcagt      480
gtgaggtttc tcacactcat gaaaatgaaa attatctctt acatgaaaaa tgcattgtga      540
aaaaggaaat tgccatgcta aaactggaaa tagccacact gaaacaccaa taccaggaaa      600
aggaaaataa atactttgag gacattaaga ttttaaaaga aaagaatgct gaacttcaga      660
tgaccctaaa actgaaagag gaatcattaa ctaaaagggc atctcaatat agtgggcagc      720
ttaaagttct gatagctgag aacacaatgc tcacttctaa attgaaggaa aaacaagaca      780
aagaaatact agaggcagaa attgaatcac accatcctag actggcttct gctgtacaag      840
accatgatca aattgtgaca tcaagaaaaa gtcaagaacc tgctttccac attgcaggag      900
atgcttgttt gcaaagaaaa atgaatgttg atgtgagtag tacgatatat aacaatgagg      960
tgctccatca accactttct gaagctcaaa ggaaatccaa aagcctaaaa attaattctca     1020
attatgccgg agatgctcta agagaaaaata cattggtttc agaacatgca caaagagacc     1080
aacgtgaaac acagtgtcaa atgaaggaag ctgaacacat gtatcaaaac gaacaagata     1140
atgtgaacaa acacactgaa cagcaggagt ttctagatca gaaattattt caactacaaa     1200
gcaaaaatat gtggcttcaa cagcaattag ttcatgcaca taagaaagct gacaacaaaa     1260
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agaaaaatga ggagatattt aattacaata accatttaaa aaaccgtata tatcaatatg     1380
aaaaagagaa agcagaaaaca gaaaactcat gagagacaag cagtaagaaa ctcttttttg     1440
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cttatgttga aaatcttacc aatagtctgt gtcaacagaa tacttatttt agaagaaaaa     1560
ttcatgattt cttcctgaag cctgggcgac agagcgagac tctgtctcaa aaaaaaaaaa     1620
aaaaaaaaagaa agaaagaaat gcctgtgctt acttcgcttc ccagg                      1665

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<210> 179

<211> 179

<212> PRT

<213> Homo sapien

<400> 179

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Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys
 20          25          30
Asn Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys
 35          40          45
Gln Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu
 50          55          60
Thr Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys
 65          70          75          80
Glu Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser
 85          90          95
Lys Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln
100          105          110
Lys Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys
115          120          125

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56

Lys Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys
 130 135 140
 Ser Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser
 145 150 155 160
 Val Arg Phe Leu Thr Leu Met Lys Met Lys Ile Ile Ser Tyr Met Lys
 165 170 175
 Ile Ala Cys

<210> 180
 <211> 1681
 <212> DNA
 <213> Homo sapien

<400> 180
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 caaaagaaat aaaatcacag ttagagaacc aaaaagttaa atgggaacaa gagctctgca 180
 gtgtgagatt gactttaaac caagaagaag agaagagaag aaatgccgat atattaaatg 240
 aaaaaattag ggaagaatta ggaagaatcg aagagcagca taggaaagag ttagaagtga 300
 aacaacaact tgaacaggct ctcagaatac aagatataga attgaagagt gtagaaagta 360
 atttgaatca ggtttctcac actcatgaaa atgaaaatta tctcttacat gaaaattgca 420
 tgttgaaaaa ggaaattgcc atgctaaaac tggaaatagc cactactgaaa caccaatacc 480
 aggaaaagga aaataaatac tttgaggaca ttaagatttt aaaagaaaag aatgctgaac 540
 ttcagatgac cctaaaactg aaagaggaat cattaactaa aagggcatct caatatagtg 600
 ggcagcttaa agttctgata gctgagaaca caatgctcac ttctaaattg aaggaaaaac 660
 aagacaaaaga aatactagag gcagaaattg aatcacacca tcctagactg gcttctgctg 720
 tacaagacca tgatcaaatt gtgacatcaa gaaaaagtca agaacctgct ttccacattg 780
 caggagatgc ttgtttgcaa agaaaaatga atggtgatgt gagtagtacg atatataaca 840
 atgaggtgct ccatcaacca ctttctgaag ctcaaaggaa atccaaaagc ctaaaaatta 900
 atctcaatta tgccggagat gctctaagag aaaatacatt ggtttcagaa catgcacaaa 960
 gagaccaacg tgaaacacag tgtcaaatga aggaagctga acacatgtat caaaacgaac 1020
 aagataatgt gaacaaacac actgaacagc aggagtctct agatcagaaa ttatttcaac 1080
 taaaaagcaa aaatatgtgg cttcaacagc aattagttca tgcacataag aaagctgaca 1140
 aaaaaagcaa gataacaatt gatattcatt ttccttgagag gaaaatgcaa catcatctcc 1200
 taaaagagaa aaatgaggag atattttaatt acaataacca tttaaaaaac cgtatatatc 1260
 aatatgaaaa agagaaagca gaaacagaaa actcatgaga gacaagcagt aagaaacttc 1320
 ttttgagaaa acaacagacc agatctttac tcacaactca tgctaggagg ccagtcctag 1380
 cattacctta tgttgaaaaa tcttaccat agtctgtgtc aacagaatac ttattttaga 1440
 agaaaaattc atgatttctt cctgaagcct acagacataa aataacagtg tgaagaatta 1500
 cttgttcacg aattgcataa aagctgcccc ggatttccat ctaccctgga tgatgccgga 1560
 gacatcattc aatccaacca gaatctcgct ctgtcactca ggctggagtg cagtgggcgc 1620
 aatctcggct cactgcaact ctgcctccca gggtcacgcc attctctggc acagcctccc 1680
 g 1681

<210> 181
 <211> 432
 <212> PRT
 <213> Homo sapien

<400> 181
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 Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys Phe Cys
 20 25 30

Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu
 35 40 45
 Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val Arg Leu
 50 55 60
 Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile Leu Asn
 65 70 75 80
 Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His Arg Lys
 85 90 95
 Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile Gln Asp
 100 105 110
 Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser His Thr
 115 120 125
 His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys
 130 135 140
 Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr
 145 150 155 160
 Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu
 165 170 175
 Lys Asn Ala Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu
 180 185 190
 Thr Lys Arg Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala
 195 200 205
 Glu Asn Thr Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu
 210 215 220
 Ile Leu Glu Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala
 225 230 235 240
 Val Gln Asp His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro
 245 250 255
 Ala Phe His Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val
 260 265 270
 Asp Val Ser Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu
 275 280 285
 Ser Glu Ala Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr
 290 295 300
 Ala Gly Asp Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln
 305 310 315 320
 Arg Asp Gln Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met
 325 330 335
 Tyr Gln Asn Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu
 340 345 350
 Ser Leu Asp Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu
 355 360 365
 Gln Gln Glu Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys
 370 375 380
 Ile Thr Ile Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu
 385 390 395 400
 Leu Lys Glu Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys
 405 410 415
 Asn Arg Ile Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Asn Ser
 420 425 430

<210> 182

<211> 511

<212> DNA

<213> Homo sapiens

<400> 182

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gaagtttcat gaggttttagc ttttctgggc tggggagtgg agagaaagaa gttgcagggc 60
ttacaggaaa tcccagagcc tgaggtttcc tcccagattt gagaactcta gattctgcat 120
cattatcttt gagtctatat tctcttgggc tgtaagaaga tgaggaatgt aataggctctg 180
ccccaagcct ttcattgcctt ctgtaccaag cttgtttcct tgtgcatcct tcccaggctc 240
tggctgcccc ttattggaga atgtgatttc caagacaatc aatccacaag tgtctaagac 300
tgaatacaaa gaacttcttc aagagtccat agacgacaat gccactacaa atgccataga 360
tgaattgaag gaatgttttc ttaaccaaac ggatgaaact ctgagcaatg ttgagggtgtt 420
tatgcaatta atatatgaca gcagtctttg tgatttattt taactttctg caagaccttt 480
ggctcacaga actgcagggt atggtgagaa a 511

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<210> 183

<211> 260

<212> DNA

<213> Homo sapiens

<400> 183

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cacctcgagg ttcagctcct ctgtcttggg gaagaaccat tcctcggcat ccttgcggtt 60
cttctctgcc atcttctcat actggtcacg catctcggtc agaatcgagg tcagggtccac 120
gccagggtga gcgtccatct ccacattgac atctccacc accctggcctc tcaggggcatt 180
catctcctcc tcgtggttct tcttcaggta ggccagctcc tccttcaggc tctcaatctg 240
catctccagg tcagctctgg 260

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<210> 184

<211> 461

<212> DNA

<213> Homo sapiens

<400> 184

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gtctgatggg agaccaaaaga atttgcaagt ggatgggtttg gtatcactgt aaataaaaaag 60
agggcctttt ctagctgtat gactgttact tgaccttctt tgaaaagcat tcccaaaatg 120
ctctattttta gatagattaa cattaaccaa cataattttt tttagatcga gtcagcataa 180
atttctaagt cagcctctag tcgtgggttca tctctttcac ctgcatttta tttgggtgtt 240
gtctgaagaa aggaaagagg aaagcaaata cgaattgtac tattttgtacc aaatctttgg 300
gattcattgg caaataattt cagtgtggtg tattattaaa tagaaaaaaa aaattttgtt 360
tcctagggtg aagggtctaat tgataccgtt tgacttatga tgaccattta tgcactttca 420
aatgaatttg ctttcaaaat aaatgaagag cagacctcgg c 461

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<210> 185

<211> 531

<212> DNA

<213> Homo sapiens

<400> 185

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tctgatttta tttccttctc aaaaaaagtt atttacagaa ggtatatatc aacaatctga 60
caggcagtga acttgacatg attagctggc atgatttttt cttttttttc ccccaaacat 120
tgtttttgtg gccttgaatt ttaagacaaa tattctacac ggcataattgc acaggatgga 180
tggcaaaaaa aagtttataaa acaaaaaccc ttaacggaac tgccttaaaa aggagacgt 240
cctagtgcct gtcattgtat attaaacata catacacaca atctttttgc ttattataat 300
acagacttaa atgtacaaag atgtttttcca cttttttcaa ttttttaaca caacagctat 360
aaacctgaac acatatgcta tcatcatgcc ataagactaa aacaattata tttagcgaca 420
agtagaaagg attaaatagt caaatacaag aatgaaaaac gcagtacata gtgtcgcgaa 480
ctcaaactcg catttagata gatccagtgg tttaaacggc acgtttttgc t 540

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<210> 186
<211> 441
<212> DNA
<213> Homo sapiens

<400> 186
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atcaaaagaa tcatcatctt taccttgact tttcagggaa ttactgaact ttctttctcag 120
aagatagggc acagccattg ccttggcctc acttgaaggg tctgcatttg ggtcctctcg 180
tctcttgcca agtttcccaa ccactcgagg gagaaatata gggagggttg acttcctccg 240
gggttttccc gagggcttca ccgtgagccc tgcggccctc agggctgcaa tcctggattc 300
aatgtctgaa acctcgctct ctgcctgctg gacttctgag gccgtcactg ccactctgtc 360
ctccagctct gacagctcct catctgtggt cctgtgtgtac tggacggggg cccaggggtc 420
ctgggggctt ttttcctgtc t 441

<210> 187
<211> 371
<212> DNA
<213> Homo sapiens

<400> 187
aaaagtgaat gagtaactat tatattgttg gcaataataa gttgcaaaat catcagggtg 60
cagggtgctg atggtgagag tgaactctgt cccagatcca ctgccgctga accttgatgg 120
gacccagat tctaaactag acgccttatg gatcaggagc tttggggctt tccctgggtt 180
ctgttgatac caggccaacc aactactaac actctgactg gcccggaag tgatgggtgac 240
tctgtctcct acagttgcag acaggggtgga aggagactgg gtcatctgga tgtcacattt 300
ggcacctggg agccagagca gcaggagccc caggagctga gcggggaccc tcatgtccat 360
gctgagtctt g 371

<210> 188
<211> 226
<212> DNA
<213> Homo sapiens

<400> 188
ggtatataaa ttgagatgcc cccccaggcc agcaaatgtt cctttttgtt caaagtctat 60
ttttattcct tgatattttt cttttttttt tttttgtgga tggggacttg tgaatttttc 120
taaagggtgct atttaacatg ggaggagagc gtgtgcggct ccagcccagc ccgctgtctca 180
ctttccacc tctctccacc tgccctctggc ttctcaggac ctgccc 226

<210> 189
<211> 391
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(391)
<223> n=A,T,C or G

<400> 189
tgggtgaagt ttattctgtt ttcacatcta ggttgttggg ganagtgata gacaaagttc 60
tggattctgg gcacgtcgg cgcattgttg taatcctact tgggaggttg anacaggaga 120
cctcgccgc naccagcta agggcgaatt ctgcanatat ccatcacact ggcggccgct 180
cgagcatgca tctanagggc ccaattcncc ctatagttag nctattaca attcactggc 240

60

cgtcgttttta caacgtcgtg actgggaaaa ccttggcggtt acccaactta atcgcccttgc 300
agcacatccc cctttcncca gctggcttaa tancgaagag gcccgcaccg atcgcccttc 360
ccaacanttg cgcagcctga atggcgaatg g 391

<210> 190

<211> 501

<212> DNA

<213> Homo sapiens

<400> 190

catcttgaggc tttttgagct gtttccgctt cttctcatcc cggtcactgt caccctcatt 60
actggaggag ctggcagagg cgttgctgtc aaactcctct gccacatctt cctcctcttc 120
acctgggttg aatgactcat cggtttcttc tcttgagtca tcgctgctgt cattggcatt 180
ctcctcccggt atcttgccct cctccttcat cctctccaag taggcatcat gctggctctc 240
atcagagtca gcatattcat cgtagcttgg gttcatgccc tctttcaatc ctcgggtttt 300
gatgttgagc tttttcgcgt tgacaaaatc aaacagtctt ccgtactcct cctctcaat 360
gctgctgaag gtatactgag tgccctgctt ggtctcaatt tcaaagtcaa aggaacgagt 420
agtagtggtta ccacgagcaa agttgacaaa ggagatctca tcgaagcgga tgtgcacagg 480
tggcttggtg acgtagatga a 501

<210> 191

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (49)

<223> n=A,T,C or G

<400> 191

ggaaaaactg tgaaaaatat atctgaattt attaagtaca gtataaaana gggttgtggc 60
aacagaaagt aaaaactaac atggattgct ataaatatgc tgaagcctag ttgttcaaat 120
gatacaattc tctcatgcta ctctaaagtt tataaagaaa aaggatttac actttacaca 180
ctgtacacaa aaggaatacc ttctgagagc cagggagtgg ggaaagggga aggagacttg 240
a 241

<210> 192

<211> 271

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(271)

<223> n=A,T,C or G

<400> 192

tggtcntgga ttcacanata aantanatcg actaaaactg gcagaaattg tgaagcaggt 60
gatagaagan caaaccacgt cccacgaatc ccaataatga cagcttcaga ctttgctttt 120
ttaacaattt gaaaaattat tctttaatgt ataaagtaat tttatgtaa ttaataaatc 180
ataatttcgt ttccacattg attaaagctg ctgtatagat ttagggngca ggacttaata 240
atagnngaaa tgaaattatg atttattaat c 271

<210> 193

<211> 351
<212> DNA
<213> Homo sapiens

<400> 193
agtctgaggcg ctgatcccta aaatggcgaa catgtgtttt catcatttca gccaaagtc 60
taacttcctg tgcctttcct atcacctcga gaagtaatta tcagttgggt tggatttttg 120
gaccaccgtt cagtcatttt gggttgccgt gctcccaaaa cattttaaat gaaagtattg 180
gcattcaaaa agacagcaga caaaatgaaa gaaaatgaga gcagaaagta agcatttcca 240
gcctatctaa tttcttttagt tttctatttg cctccagtgc agtccatttc ctaatgtata 300
ccagcctact gtactattta aaatgctcaa tttcagcacc gatggacctg c 360

<210> 194
<211> 311
<212> DNA
<213> Homo sapiens

<400> 194
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caccctccct ctgctgggat gaggtccagg agccaactaa aacaatggca gaggagacat 120
ctctgggtgtt cccaccacc tagatgaaaa tccacagcac agacctctac cgtgtttctc 180
ttccatccct aaaccacttc cttaaaatgt ttggatttgc aaagccaatt tggggcctgt 240
ggagcctggg gttggatagg gccatggctg gtccccacc atacctcccc tccacatcac 300
tgacacagac c 311

<210> 195
<211> 381
<212> DNA
<213> Homo sapiens

<400> 195
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gccaacagga tgacatgaaa tgatgtactc agaagtgtcc tggaatgggg cccatgagat 120
ggttgtctga gagagagctt cttgtcctgt ctttttcctt ccaatcaggg gctcgctctt 180
ctgattattc ttcagggcaa tgacataaat tgtatattcg gttccccggt ccaggccagt 240
aatagtagcc tctgtgacac cagggcgggg ccgagggacc acttctctgg gaggagaccc 300
aggcttctca tacttgatga tgtagccggt aatcctggca cgtggcggtt gccatgatac 360
cagcagggaa ttgggtgtgg t 381

<210> 196
<211> 401
<212> DNA
<213> Homo sapiens

<400> 196
cacaacaag aggagcacca gacctcctct tggcttcgag atggcttcgc cacaccaaga 60
gccccaacct ggagacctga ttgagatttt ccgccttggc tatgagcact gggccctgta 120
tataggagat ggctacgtga tccatctggc tcctccaagt gactaccccg gggctggctc 180
ctccagtgtc ttctcagtcc tgagcaacag tgacagagtg aaacgggagc gcctggaaga 240
tgtgggtggga ggctgttgct atcgggtcaa caacagcttg gaccatgagt accaaccacg 300
gcccgtggag gtgatcacca gttctgcgaa ggagatggtt ggtcagaaga tgaagtacag 360
tattgtgagc aggaactgtg agcactttgt caccagacc t 401

<210> 197
<211> 471

<212> DNA

<213> Homo sapiens

<400> 197

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ctgtaatgat gtgagcaggg agccttcctc cctggggccac ctgcagagag ctttcccacc 60
aactttgtac cttgattgcc ttacaaagtt atttgtttac aaacagcgac catataaaag 120
cctcctgccc caaagcttgt gggcacatgg gcacatacag actcacatac agacacacac 180
atatatgtac agacatgtac tctcacacac acaggcacca gcatacacac gtttttctag 240
gtacagctcc caggaacagc taggtgggaa agtcccatca ctgagggagc ctaaccatgt 300
ccctgaacaa aaattgggca ctcatctatt ccttttctct tgtgtcccta ctcattgaaa 360
ccaaactctg gaaaggaccc aatgtaccag tatttatacc tctagtgaag cacagagaga 420
ggaagagagc tgcttaaact cacacaacaa tgaactgcag acacagacct g 480
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<210> 198

<211> 201

<212> DNA

<213> Homo sapiens

<400> 198

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gggccattga ggctctgtcg gccatgcccc cagttcgaag ctttgccaac gaggagggcg 60
aagcccagaa gtttagggaa aagctgcaag aaataaagac actcaaccag aaggaggctg 120
tggcctatgc agtcaactcc tggaccacta gtatttcagg tatgctgctg aaagtgggaa 180
tcctctacat tggtyggcag a 201
```

<210> 199

<211> 551

<212> DNA

<213> Homo sapiens

<400> 199

```
tctggcacag atcttcaccc acacggcggt ccacgtgctg atcatcttcc ggggtctcacc 60
gggcctggaa cacaccatct tccccatgag cccggtgccc agtctggtga cttccatctt 120
ggcccctggc cttatgtccc agttatgacc cctgacttca actctggctc ttaccctgta 180
actccagtc atctctgaca tttttaacac ccggccttgt gaccgtggac atagctcctg 240
acctcgattc ccatcttgag ccagtggtta gtccatgaga tcatgacctg actcctggtc 300
tccaaccttg tgatccta atctgggacct caatcctagc ctctgaactt gggaccttg 360
agctcctgac cttagtcttg accgctaccc ttgattctga cctttgatcc tgtaacttag 420
gggtggcccc tgaccttatt actgtcattt agctccttga ccttgccact tcaatcctgg 480
ctttatgacc tcctactctc aattttaact ttaaccaa atgaccaaattt gtgacactaa 540
atgaccacaa t 551
```

<210> 200

<211> 211

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(211)

<223> n=A,T,C or G

<400> 200

```
cagctcancg ggcgacatgc ccctacaagt tggcanaagn ggctgccact gctggggttg 60
tgtaagagag gctgctgnca ccattacctg cagaaacctt ctcatagggg ctacgatcgg 120
tactgctagg gggcacatag cgcccatggg tgtggtaggt ggggnactcn ntataggat 180
```

ggtaggtatc ccgggctgga aanatgnnca g

211

<210> 201

<211> 111

<212> DNA

<213> Homo sapiens

<400> 201

ccagtgaaag gaaacaaaac tggcagtttg tccatttgaa tatcagacct agtttcttct 60
taatttccac actatttctc ccatattcct taaacttctt ggcattccacc t 120

<210> 202

<211> 331

<212> DNA

<213> Homo sapiens

<400> 202

tgaaaataca gaataccagg tgggtcccaa tgtttgaagt tctttgaaca gaaagagaga 60
ggagagagag agagaggaaa attccctaac ccttggttta aagacaatat tcattttattg 120
ctcaaatgat gcttttaagg gaggcagtg gaataaaaata aacttttttt ttctccctac 180
aatacataga agggttatca aaccactcaa gtttcaaaat ctttccaggg tccaatatca 240
cttttttctc ttcggttcaa tgaaaagcta aatgtaataa tactaattat agataaaaatt 300
ttattttact ttttaaaaat ttgtccagac c 331

<210> 203

<211> 491

<212> DNA

<213> Homo sapiens

<400> 203

agtcacccag tctacttagt acctgggtgc tgcctctgac cttttcagct tgataccctg 60
ggcttttagtg taaccaataa atctgtagtg accttacctg tatteccctgt gctatccctgt 120
gggaaggtag gaattgggcta agtatgatga atgtataggt tagggatctt ttgggttttaa 180
atcacagaaa acctaatca aactggctta aaataaaaag gatttattgg ttcagtgaac 240
tagaaagtcc ataggtagtg ctggctccag gtgaagactt gacctagtag ttcagtatgt 300
ctctaaatac cggactgact tttttctcac tgttgcatct tctgtaggac catttaagtc 360
tggggccactt aatggctgcc agcattccta agattacact tttccccatt tatgtccaat 420
cagaaaaaga aggcattctt gtaccagaaa tctcagcaaa agccctaata ttcacactga 480
ttaggacctg c 491

<210> 204

<211> 361

<212> DNA

<213> Homo sapiens

<400> 204

tcccttcttc ccccatgtga taaatgggtc cagggctgat caaagaactc tgactgcaga 60
actgccgctc tcagtggaca gggcatctgt taccctgaga cctgtggcag acacgtcttg 120
ttttcatttg atttttgtta agagtgcagt attgcagagt ctagaggaat ttttgtttcc 180
ttgattaaca tgattttcct ggttggtaca tccagggcat ggcagtggcc tcagccttaa 240
acttttgttc ctactccac cctcagcgaa ctgggcagca cggggagggt ttggctaccc 300
ctgcccattc ctgagccagg taccaccatt gtaaggaaac actttcagaa attcagacct 360
c 361

<210> 205

<211> 471
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (2)
 <223> n=A,T,C or G
 <221> misc_feature
 <222> (3)
 <223> n=A,T,C or G

<400> 205
 cnngtacagt tcttcctgga tggccgacac agatcctggg gaaaggcaat cctggcactg 60
 ctctgaaacc agagctcctc ctccctcccc gggcaggggtg gagctgagaa gggctgctct 120
 agcgttggga ctccacctcc atacacctga tattttgata gggcaggtcc ctgctatggg 180
 ccactgttct gggcagtata gtatgcttga cagcatcctt ggcactctatc caccagatcc 240
 cagagcaccc gctactagct gtgacaacat cctccaaaca ttgcaaaatt tccccctggga 300
 ggcaagattg cctcagatgg gagaatcacg ctctagggaa atctgctggg atgagaaccc 360
 caactcccca ctccactgag cctccagatg gcgagcaggc tgcagctcca gcacagacac 420
 gaagctccct ccagccactg acggtccatg gctgggggta cccaggacct c 480

<210> 206
 <211> 261
 <212> DNA
 <213> Homo sapiens

<400> 206
 tagagtattt agagtcctga gataacaagg aatccaggca tccttttagac agtcttctgt 60
 tgtcctttct tcccaatcag agatttgtgg atgtgtggaa tgacaccacc accagcaatt 120
 gtacgcttga tgagagaatc caattcttca tctccacgaa tagcaagttg caagtgcaga 180
 ggggtaatac gctttacctt taagtctttt gatgcatttc ctgccagttc aagtacctct 240
 gcgggtgaggt actccaggat g 261

<210> 207
 <211> 361
 <212> DNA
 <213> Homo sapiens

<400> 207
 gctctccggg agcttgaaga agaaactggc tacaaagggg acattgccga atgttctcca 60
 gcggtctgta tggacccagg cttgtcaaac tgtactatac acatcgtgac agtcaccatt 120
 aacggagatg atgccgaaaa cgcaaggccg aagccaaagc caggggatgg agagtttgtg 180
 gaagtcattt ctttacccaa gaatgacctg ctgcagagac ttgatgctct ggtagctgaa 240
 gaacatctca cagtggacgc cagggtctat tcctacgctc tagcactgaa acatgcaaat 300
 gcaaagccat ttgaagtgcc cttcttgaaa ttttaagccc aaatatgaca ctggacctgc 360
 c 361

<210> 208
 <211> 381
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature

<222> (1)...(381)

<223> n=A,T,C or G

<400> 208

```
agaggagatn tttgccatgc ctgaatnctt tectatncca cectancact taacatatta 60
cttagtctgc tttgntaaaa gcaagtatta ccttnaactt gnetcttact ctttgccctt 120
tagctaacta ataaagnttg atntaggcat tattatataa ttctgagtea ttcattggtat 180
ctctcatgtt tgatgtatct tncaaactaa gatctatgat agtttttttt ccanagtccc 240
attaaatcat ttatttcctt tacttttctc cctctgtnga aacatttaga aactggattt 300
gggaacccan ttttggaata ccagattcat agtcatgaaa atggaaactt ncatattctg 360
tttttgaaaa gatgtggacc t                                     381
```

<210> 209

<211> 231

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (83)

<223> n=A,T,C or G

<400> 209

```
gtggagagca agtgatttat taaagcaaga cggtgaaacc tttacattct gcagtgaaga 60
tcagggtgtc attgaaagac agnggaaacc aggatgaaag tttttacatg tcacacacta 120
catttcttca atattttcac caggacttcc gcaatgaggc ttctgttctg aagggacatc 180
tgatccgtgc atctcttcac tcttaacttg gctgcaacag ctccacctg c 240
```

<210> 210

<211> 371

<212> DNA

<213> Homo sapiens

<400> 210

```
tccatcctgg ttttgcagag atcagggtgt tgacagttcc tgggtgaccc acagctaccc 60
atgtcagtta tctccactaa catatccaag aatctttgta ggacaatttc tccacctgca 120
aggtttttta ggtagaactc ttcttttaag gcaattagcc cattgccaaa aggttttact 180
gtcttaaagc tgtctttctg agatctaatt ccaaggactt ctccacagct aagtgagatg 240
cctcacacca ttaggtgatg ctttggacag aacagagtat ttctatcttg tgtttaaagc 300
aattccttgg cttcggtccc tcaccacttt ctatgccagt ctcccattta tgtccctagt 360
aatgcctatg c                                     371
```

<210> 211

<211> 471

<212> DNA

<213> Homo sapiens

<400> 211

```
tttattttta aagaaaaaaa ttaaaataga gccacaaat gcaattaaga aaaaaaaagt 60
attgagacac aaggggacct acatgttctg gtctaagaag catgcaagta ttacaaagca 120
ttccagatag agtatgacag aggaacagtg aacaagcatt ggaacgatgc tctttcttcc 180
agaaaaggga agtctaacag ttatgttttc acaatggtag tgattaaacc atctttattt 240
ttaagggaatt ttataggaag aatttttagc ccatcattaa aggaaaaata ataatacctt 300
tttagccctg cctatctcca gtcttggaaat aataacagaa gcatagcacc tttcagtatc 360
taaaatataa acaagaatag taagtccatc ccagcttcta gagatgaggt agctcatgct 420
```

aagaaatggtt ggggtcatttt tcctatgaaa gttcaaaggc caaatgggtca c 480

<210> 212

<211> 401

<212> DNA

<213> Homo sapiens

<400> 212

tggcctgtct ccttcacata gtccatatca ccacaaatca cacaacaaaa gggagaggat 60
atattttggg ttcaaaaaaa gtaaaaagat aatgtagctg catttccttg gttatttttg 120
gccccaaata tttcctcatc tttttgttgt tgtcatggat ggtggtgaca tggacttgtt 180
tatagaggac aggtcagctc tctggctcgg tgatctacat tctgaagttg tctgaaaatg 240
tcttcatgat taaattcagc ctaaacgttt tgccgggaac actgcagaga caatgctgtg 300
agtttccaac ctccagcccat ctgcgggcag agaaggtcta gtttgtccat caccattatg 360
atatcaggac tggttacttg gttaaggagg ggtctacctc g 401

<210> 213

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(461)

<223> n=A,T,C or G

<400> 213

tgtgaagcat acataaataa atgaagtaag ccatactgat ttaatttatt ggatgttatt 60
ttccctaaga cctgaaaatg aacatagtat gctagtatt tttcagtgtt agcctttttac 120
tttcctcaca caatttggaa tcatataata taggtacttt gtccctgatt aaataatgtg 180
acggatagaa tgcataaggt gtttattatg aaaagagtgg aaaagtatat agctttttanc 240
aaaaggtgtt tgccatttct aagaaatgag cgaatatata gaaatagtgn gggcatttct 300
tcctgttagg tggagtgtat gtgttgacat ttctcccat ctcttccac tctgttttnt 360
ccccattatt tgaataaagt gactgctgaa nangactttg aatccttatt cacttaattt 420
aatgttttaa gaaaaaccta taatggaaag tgagactcct t 461

<210> 214

<211> 181

<212> DNA

<213> Homo sapiens

<400> 214

cctgagcttc tactcctttc ccttaagatt cctccaaagc accagctcca taaaatcctt 60
cagctcccca gacccacacc aagaacccca catgttaatt ggatcagcca aatctacaag 120
cagataagtc ctaaggagaa tgccgaagcg tttttcttct tcctcaagcc tagcatgaga 180
c 181

<210> 215

<211> 581

<212> DNA

<213> Homo sapiens

<400> 215

ctgctttaag aatggttttc caccttttcc ccttaatctc taccaatcag acacatttta 60
ttatttaaat ctgcacctct ctctatttta tttgccaggg gcacgatgtg acatatctgc 120

agtcccagca cagtgggaca aaaagaattt agaccccaaa agtgtcctcg gcatggatct 180
tgaacagaac cagtatctgt catggaactg aacattcacc gatggtctcc atgtattcat 240
ttattcactt gttcattcaa gtatttattg aatacctgcc tcaagctaga gagaaaagag 300
agtgcgcttt ggaaatttat tccagttttc agcctacagc agattatcag ctcggtgact 360
tttctttctg ccaccattta ggtgatggtg tttgattcag agatggctga atttctattc 420
ttagcttatt gtgactgttt cagatctagt ttgggaacag attagaggcc attgtcctct 480
gtcctgatca ggtggcctgg ctgtttcttt ggatccctct gtcccagagc caccagaac 540
cctgactctt gagaatcaag aaaacacca gaaaggacct c 581

<210> 216

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 216

ccgatgtcct gcttctgtgg accaggggct cctctgnnng tggcctcaac cacggctgag 60
atccctagaa gtccaggagc tgtggggaag agaagcactt agggccagcc agccgggcac 120
ccccacttgc gccccgaccc acgctcacgc accagacctg ccnnggcggt cgctcnaaag 180
ggcgaattct gcagatatcc atcacactgg cggacgctcg agcatgcac tagagggccc 240
aattcacctt atantgagtc gtattacaat tcaactggccg t 281

<210> 217

<211> 356

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(356)

<223> n=A,T,C or G

<400> 217

atagcagggt tcaacaattg tcttgtagtt tgnagtaaaa agacataaga aagagaaggt 60
gtggttttgc gcaatccgta gttggtttct caccataccc tgcagttctg tgagccaaaag 120
gtcttgacga aagttaaaat aaatcacaaa gactgctgtc atatattaat tgcataaaca 180
cctcaacatt gtcagagtt tcatccgttt ggttaagaaa acattccttc aattcatcta 240
tggcatttgt agtggcattg tcgtctatga actcttgaag aagttctttg tattcagttc 300
tagacacttg tggattgatt gncttggaag tcaattctc caataaggga cctcgg 360

<210> 218

<211> 321

<212> DNA

<213> Homo sapiens

<400> 218

ttgtccatcg ggagaaaggt gtttgtcagt tgtttcataa accagattga ggaggacaaa 60
ctgctctgcc aatttctgga tttcttttatt ttcagcaaac actttcttta aagcttgact 120
gtgtgggacac tcatccaagt gatgaataat catcaagggt ttgttgcttg tcttggattt 180
atatagagct tcttcatatg tctgagtcga gatgagttgg tcaccccaac ctctggagag 240
ggctctggggc agtttgggtc gagagtcctt tgtgtccttt ttggctccag gtttgactgt 300

ggtatctctg gacctgacctg g

321

<210> 219

<211> 271

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (41)

<223> n=A,T,C or G

<400> 219

```
ccggttaggt ccacgcgggg gcagtggagg cacaggctca nggtggccgg gctacctggc 60
accctatggc ttacaaagta gagttggccc agtttccctc cacctgaggg gagcactctg 120
actcctaaca gtcttccttg ccctgccatc atctgggggtg gctggctgtc aagaaaggcc 180
gggcatgctt tctaaacaca gccacaggag gcttgtaggg catcttcag gtggggaaac 240
agtcttagat aagtaagggt acttgtctaa g 271
```

<210> 220

<211> 351

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (351)

<223> n=A,T,C or G

<400> 220

```
gtcctacgac gaggaccagc ttttcttctt cnacttttcc canaacactc gggtgacctg 60
cctgcccga tttgtgact gggctcagga acagggagat gctcctgcca ttttatttga 120
caaagagttc tgcgagtggg tgatccagca aatagggcca aaacttgatg ggaaaatccc 180
gggtgtccaga gggtttctta tcgctgaagt gttcacgctg aagccctgg agtttgga 240
gccaacact ttgggtctgt ttgtcagtaa tctcttcca ccatgctga cagtgaactg 300
gtagcatcat tccgtccctg tggaaggatt tgggcctact tttgtctcag a 360
```

<210> 221

<211> 371

<212> DNA

<213> Homo sapiens

<400> 221

```
gtctgcagaa gcgtgtctga ggtgtccggg ggaggtggca gccgagctct gggactaatc 60
accgtgctgg ggacggcacc gcgtcaggat gcaggcagat ccctgcagaa gtgtctaaaa 120
ttcacactcc tcttctggag ggacgtcgat ggtattagga tagaagcacc aggggacccc 180
acgaacgggt tcgtcgaaac agcagccctt atttgcacac tgggagggcg tgacaccagg 240
aaaaccacaa ttctgtcttt cacggggggc cactgtacac gtctctgtct gggcctcggc 300
caggggtgcc agggccagca tggacaccag gaccagggcg cagatcacct tgttctccat 360
ggtggacctc g 371
```

<210> 222

<211> 471

<212> DNA

<213> Homo sapiens

<400> 222
gtccatgttc catcattaat gttccaacat caccagggac acaaagctgc aaaaatgaga 60
agggaaataa ggtagagaa aggatccggg caatcttaag gactgaggaa gacatgttcc 120
ccaacccttg aactcacaaa ccctgaagct caaggattgc atccttcctc caaatctcac 180
tcaacataat aagtgcagaa caacatgcc aagcactgta tgaagcacta gggacaaaga 240
caagggtcaaa atccttgtaa ccaaatttaa tggattgta atgcagtgtt aacacaggac 300
agtaacagaa cacccaagaa ccaaacagaa gagggtaggg ataagcataa atgaagtaac 360
atgaaataaa cttccaaatg gaaaacttgt ccataccccc agggcaagtc aactacagtc 420
tcccaaagga cataaattcc acttagggca cactagacag aaaacaatat t 480

<210> 223

<211> 411

<212> DNA

<213> Homo sapiens

<400> 223

agttgctcta caatgacaca caaatcccgt taaataaatt ataaacaagg gtcaattcaa 60
atgtgaagta atgttttagt aaggagagat tagaagacaa caggcatagc aaatgacata 120
agctaccgat taactaatcg gaacatgtaa aacagttaca aaaataaacg aactctcctc 180
ttgtcctaca atgaaagccc tcatgtgcag tagagatgca gtttcatcaa agaacaaaca 240
tccttgcaaa tgggtgtgac gcggttccag atgtggattt ggcaaacct catttaagta 300
aaaggttagc agagcaaagt gcggtgcttt agctgctgct tgtgccgctg tggcgtcggg 360
gaggctcctg cctgagcttc cttccccagc tttgctgcct gagaggaacc a 420

<210> 224

<211> 321

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (31)

<223> n=A,T,C or G

<400> 224

ggtctgaagt ttgataacaa agaaatatat ntaagacaaa aatagacaag agttaacaat 60
aaaaacacaa ctatctgttg acataacata tggaaacttt ttgtcagaaa gctacatctt 120
cttaatctga ttgtccaaat cattaaaata tggatgattc agtgccattt tgccagaaat 180
tcgtttggct ggatcataga ttaacatttt cgagagcaaa tccaagccat tttcatccaa 240
gtttttgaca tgggatgcta ggcttcctgg tttccatttg ggaaatgtat tcttatagtc 300
ctgtaaagat tccacttctg g 321

<210> 225

<211> 251

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (34)

<223> n=A,T,C or G

<400> 225

atgtctgggg aaagagttca ttggcaaaag tgnctccca agaatggttt acaccaagca 60

```

gagaggacat gtcactgaat ggggaaagg aacccccgta tccacagtca ctgtaagcat 120
ccagtaggca ggaagatggc tttgggcagt ggctggatga aagcagattt gagataccca 180
gctccggaac gaggtcatct tctacagggt cttccttcac tgagacaatg aattcagggt 240
gatcattctc t                                     251

```

```

<210> 226
<211> 331
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> unsure
<222> (1)...(331)
<223> n=A,T,C or G

```

```

<400> 226
gttaggtccc agggcccccg ccaagnnggt accnnntna ccactcctga cccaaaaatc 60
aggcatggca ttaaaacgtt gcaaattcct ttactgttat cccccccacc accaggacca 120
tgtagggtgc agtctttact ccctaaccgg tttcccgaaa aagggtgctac ctcctttcca 180
gacagatgag agagggcagg acttcagggt ggatccacca ctgggctctc cctccccccag 240
cctggagcac gggaggggag gtgacggctg gtgactgatg gatgggtagt gggctgagaa 300
gaggggacta ggaagggtta ttccagggtc a                                     331

```

```

<210> 227
<211> 391
<212> DNA
<213> Homo sapiens

```

```

<400> 227
aggtctgccc ttgaagtata ggaaggaatc atagttggag gacttctgca ttatttggtg 60
gctgaagcta gaagtgcaac cccctcctga tttctgcagc aagatgaact gccttatccc 120
cagcccgcag gaatgttcat atctgagcaa tcaatgggca ctgtgttcaa ccacgccatt 180
ttcaagattg gctccttaaa ccaccacaaa ggcaccagct ctgggagaag ctgcagggag 240
aagagaacaa agccctcgct gtgatcagga tgggtgtctc ataccttttc tctgggggtca 300
ttccagggtat gagacagagt tgaacctgcg catgagcgtg gaggccgaca tcaacggcct 360
gcgcagggtg ctggatgagc tgaccttgga c                                     391

```

```

<210> 228
<211> 391
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (35)
<223> n=A,T,C or G

```

```

<400> 228
gttggtccata gccacctcct gggatagaag cttntagtt catagttcga ttagtggtgc 60
cttaggacat aggtccagcc ctacagatta gctgggtgaa gaaggcaagt gtctcgacag 120
ggcttagtct ccacctcag gcatggaacc attcagggtg aagcctggga tgtgggcaca 180
ggagactcag gctgatataa aaataacaaa atcagtaata aaaaaattat aaaacctgtt 240
gcttggtctga atagatttga gcaacagtct tgcttttgtt aaaatcctgg agccgttaag 300
tcttgaatat tcttctggac atcattgctg gctggagaaa ggagccccag gcccggtcgc 360
gctgacatct gtcagggttg gaagtctcat c                                     391

```

<210> 229
<211> 341
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (202)
<223> n=A,T,C or G

<400> 229
gtccatggct tctcaccag acagtcttctc tgggcaactt ggggaagccc ctgttctgct 60
caagtctcac cccatggaag aggtggggga agggggcctt ggtttttcag gaagacgggt 120
tggagagcac gagtcactac aaagcagtaa aagtgaatgg tgtctccagg ggctgggtcc 180
agaacaccgc ggagagcccc anccataaag gtgtgttccg cctctggcct gcaggaatct 240
ctttgaatct ctttgattgg tggctccaag agcaatggga agtcaacagc caggaggctg 300
gactgggttc cctgggaccc cgaggtccca gaggctgctg g 341

<210> 230
<211> 511
<212> DNA
<213> Homo sapiens

<400> 230
gtccaagcca aggaaaccat tcccttacag gagacctccc tgtacacaca ggaccgcctg 60
gggctaaagg aaatggacaa tgcaggacag ctagtgtttc tggctacaga aggggacct 120
cttcagttgt ctgaagaatg gttttatgcc cacatcatat cattccttgg atgaaacccg 180
tatagttcac aatagagctc agggagcccc taactcttcc aaaccacatg ggagacagtt 240
tccttcatgc ccaagcctga gctcagatcc agcttgcaac taatccttct atcatctaac 300
atgcctact tggaaagatc taagatctga atcttatcct ttgccatctt ctgttacct 360
atggtgttga atgcaagttt aattaccatg gagattgttt taaaaacttt tgatgtgggtc 420
aagttcagtt ttagaaaagg gagtctgttc cagatcagtg ccagaactgt gccagggcc 480
aaaggagaca actaactaaa gtagtgagat a 511

<210> 231
<211> 311
<212> DNA
<213> Homo sapiens

<400> 231
ggtccaagta agctgtgggc aggcaagccc ttcggtcacc tgttggttac acagaccct 60
cccctcgtgt cagctcaggc agctcaggc ccccgaccaa cacttgagg ggccctgct 120
agttagcgcc ccaccgccgt ggagttcgta ccgcttcctt agaacttcta cagaagccaa 180
gctccctgga gccctgttgg cagctctagc tttgcagtcg tgtaattggc ccaagtcatt 240
gtttttctcg cctcacttcc caccaagtgt ctagagtcac gtgagcctcg tgatcatctc 300
gggggtggacc t 311

<210> 232
<211> 351
<212> DNA
<213> Homo sapiens

<400> 232
tcgtttagct aataatccct tccttgatga tacactccaa cttcttgttt ttctttattt 60

ctaaaaagcg gttctgtaac tctcaatcca gagatgttaa aaatgtttct aggcacggta 120
ttagtaaatc aagtaaatct catgtcctct taaaggacaa acttccagag atttgaatat 180
aaatTTTTat atgtgttatt gattgtcgtg taacaaatgg cccccacaaa ttagtagctt 240
aaaatagcat ttatgatgtc actgttttct ttgccttttc attaatgttc tgtacagacc 300
tatgtaaaca acttttgtat atgcatatag gatagctttt ttgagggtat a 360

<210> 233

<211> 511

<212> DNA

<213> Homo sapiens

<400> 233

aggtctggat gtaaggatgg atgctctcta tacatgctgg gttggggatg ctgggactgc 60
acagccaccc ccagtatgcc gctccaggac tctgggacta gggcgccaaa gtgtgcaaat 120
gaaaatacag gatacccagg gaactttgaa ttccagattg tgaaaagaaa acaaatcttg 180
agactccaca atcaccaagc taaaggaaaa agtcaagctg ggaactgctt agggcaaagc 240
tgcttcccat tctattcaca gtcattcccc tgaggctcac ctgcatagct gattgcttcc 300
tttcccttat cgcttctgta aaaatgcaga ctactgagc cagactaaat tgtgtgttca 360
gtggaaggct gatcaagaac tcaaaagaat gcaacctttt gtctcttatc tactacaacc 420
aggaagcccc cacttaagggt ttgtccacc ttactggact gaaccaaggt acatcttaca 480
cctactgatt gatgtctcat gtccccctaa g 511

<210> 234

<211> 221

<212> DNA

<213> Homo sapiens

<400> 234

caggtccagc gaaggggctt cataggctac accaagcatg tccacataac cgaggaagct 60
ctctccatca gcatagcttc cgatgaccat ggtgttccac aaaggggtca tcttcgagcg 120
ccggctgtac atggccctgg tcagccatga atgaatagct ctaggactat agctgtgtcc 180
atctcccaga agctcctcat caatcaccat ctggccgaga c 221

<210> 235

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (33)

<223> n=A,T,C or G

<400> 235

ggtccaagaa agggacatct atgtgaaagt ganactgaga cagtgtctggt cacagggtcat 60
gctgcagaat aatacattcc caggcactgt cacgtggggg acccaagagg cccaggaggt 120
gacctataac ctctccagaa agaccactct gtgtggcatc acagtccaca cagttaaagg 180
aaatatttag acttaacaat cagacaccag ctcttactca cacttacact cacagcccac 240
acacaagtgt gcaaacatac acacacatat atatttcttg atacattcat ggaatatcag 300
agccctgccc tgaagtcggt agtgtctctg ctccccaaac cgctgctccc acattggcta 360
agctccctca agagacctca g 381

<210> 236

<211> 441

<212> DNA

<213> Homo sapiens

<400> 236

```
aggctcctggt gcccttttct ttgcccacac ttgcgcattt gggaattgga atatttaccc 60
aacacctgta ctgcattgaa tattggaagc aaataacttg gctttgatct tataggctca 120
cagatggagg aacgtacctt gaagttcaga tgagatttcg gacttttgag ttgatgctga 180
aacagcttga gattttttggg gactactgag agatgataat tgtattgtgc aatatgagaa 240
ggacatgaga ttgggtgggc ataggtgtga aatgacattg ttgggatgtg ttaccctcc 300
aaatctcttg ttgaatgtga tcttaaactg tgggtgggtggg cctagtggaa ggtgttgaat 360
catgggggtg gactcttcat aatttgctta gctccatccc cttggtgatg agcaagtcct 420
tgctctgttg tgcacatga g                                     441
```

<210> 237

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 237

```
tcctaaaaaa ttagctgacc ttgttaaaaa tgttggcgtg agcagtatat tattacctat 60
ctttttttat tgttgtgtg nggtgtgtgn ttaactaat tggctgaaat atctgcctgt 120
ttccctcttt acatttttct tgtttctttc cttattttatc ttgtgccatc ttgagatcta 180
ctgtaaaagt aatnttttaa tgaaaacann nccaagttnt actctcactg ggnttgggac 240
atcagatgta attgagaggc caacaggtaa gtcttcatgt c                                     281
```

<210> 238

<211> 141

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(141)

<223> n=A,T,C or G

<400> 238

```
gtctgcctcc tctactgtt tccctctatn aaaaagcctc cttggcgag gttccctgag 60
ctgtgggatt ctgcactggg gcttnggatt cctgatatg ttccttcaaa tccactgaga 120
attaaataaa catcgctaaa g                                     141
```

<210> 239

<211> 501

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(501)

<223> n=A,T,C or G

<400> 239

```

aacaatctaa acaaatccct cggttctann atacaatgga tcccccatat tggaaggact 60
ctgangcttt attccccac tatgcntatc ttatcatttt attattatac acacatccat 120
cctaaactat actaaagccc ttttcccatg catggatgga aatggaagat ttttttttaa 180
cttgttctag aagtcttaat atgggctgtt gccatgaagg cttgcagaat tgagtccatt 240
ttctagctgc ctttattcac atagtgatgg ggtactaaaa gtactgggtt gactcagaga 300
gtcgtgtgca ttctgtcatt gctgtactc taacactgag caacactctc ccagtggcag 360
atccccctgta tcattccaag aggagcattc atccctttgc tctaataatc aggaatgatg 420
cttattagaa aacaaactgc ttgaccagg aacaagtggc ttagcttaag naaacttggc 480
tttgctcana tcctgatcc t

```

<210> 240

<211> 451

<212> DNA

<213> Homo sapiens

<400> 240

```

tgctctgaaa ggccattact aatagaaaca cagcctttcc aatcctctgg aacatattct 60
gtctgggttt ttaatgtctg tggaaaaaaa cttaacaagt ctctgtctca gttaagagaa 120
atctattggg ctgaagggtt ctgaacctct ttctggttct cagcagaagt aactgaagta 180
gatcaggaag gggctgcctc aggaaaaattc ctatgcctta ggaattcagt gagaccctgg 240
gaaggaccag catgctaata agtgtcagtg aatccacagt ctttacttcc tgcctcataa 300
agggccaggt ctccccagta ccaagtcctt tcctcatgaa gttgtgttgc ctgaggctgt 360
ttagggacca ttgctgtctc tggtcacatg agctgtctc cttactttag tccctgggca 420
atccttgctt aatgcttttg ttgactcaac g

```

<210> 241

<211> 411

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(411)

<223> n=A,T,C or G

<400> 241

```

aatctccagt gtgatgggat cgggggttaga gcttcaatct ccagtgtgat ggtactgcag 60
cnagagcttc aatctccagt gngatgggat taggggttaga tcttcaatct ccagtgtgat 120
ggatcagggg ttagagcttc agcctccagt gtgatgggat cagggttaga gcttcagcct 180
ccagtgtgat ggtatcgggg ttagatcttc aatccccagt ggtggtggtt agagcttcaa 240
tctccagtgt gatggtattg ggggttagagc ttcaatctcc agtctgatgg tggttcggga 300
tggggctttt aagatgtaat taggggttaa gatcataagg gacctggtct gatggggatt 360
agtncgcttn tatgaagaga cacangaggg cttgctctat ctctgactct c 420

```

<210> 242

<211> 351

<212> DNA

<213> Homo sapiens

<400> 242

```

tcccccttca caacagtaga gacctacaca gtgaactttg gggacttctg agatcagcgt 60
cctaccaaga cccagccca actcaagcta cagcagcagc acttcccaag cctgctgacc 120
acagtcacat caccatcag cacatggaag gcccctggta tggacactga aaggaagggc 180
tggtcctgcc cctttgaggg ggtgcaaaca tgactgggac ctaagagcca gaggtctgtg 240
agaggctcct gctccacctg ccagtctcgt aagaaatggg gttgctgcag tgttgagata 300

```

ggggcagagg gagggagcca aggtcactcc aataaaacaa gctcatggca c 360

<210> 243

<211> 241

<212> DNA

<213> Homo sapiens

<400> 243

gtctgtgctt tatcaggaaa agcacaagaa tatgtttttc tacctaaaac cctcttctac 60
tttaaaaatg gtttgctgaa tttttctatg tttttaaaat gtttttatgc ttttttttaa 120
acacgtaaag gatggaacct aatcctctcc cgagacgcct cctttgtgtt aatgcctatt 180
cttacaacag agaaacaagt acattaatat aaaaacgagt tgattattgg ggtataaaat 240
a 241

<210> 244

<211> 301

<212> DNA

<213> Homo sapiens

<400> 244

ggtccagagc aatagcgtct gtggtgaagc gcctgcactc ctgaggagac atgcctggct 60
tatatgctgc atccacataa ccatagataa aggtgctgcc ggagccacca atggcaaaaag 120
gctgtcgagt cagcattcct cccaggggtc catatacctg acctccttca cgttgggtccc 180
agccagctac catgagatgt gcagacaagt cctctcgata tttatagctg atattttctca 240
ccacatttgc agcagccaaa acaagtggag gtctctccag ttctatccca tggagctcca 300
g 301

<210> 245

<211> 391

<212> DNA

<213> Homo sapiens

<400> 245

ctgacactgc tgatgtgggc cgggggggcgc cgaggcacaa ctggtggccg gaccattgag 60
gcacctggag ggtaggcagc ttgtggtgca gacaccacag agagagaaaa gttggatgga 120
gtggtgggaa taatcagggg ggcacactgt gcctagaagc ttccagggcc accaagagaa 180
tggaagggga aactacaaca ttcacaacag aaataggagt caattcactt agaccagaa 240
ctccagaaaag ggggagtgtg ggaatctaca atttcaaagc cagctcgtgt ctacctagag 300
cccaaactg cataagcacc aggattgtac accttagtcc ctcaagatag tttcaagtga 360
gcgtgcaatt cactcttaca gaggagggcc t 391

<210> 246

<211> 291

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(291)

<223> n=A,T,C or G

<400> 246

tcctccacag gggaagcagg aagttnagcc agcttcaggc tggaaactgc ccagggcaca 60
gagctggcaa ggtgcaaagn cntctgcaga atattcacca ggttgacaca gacctccaca 120
ttcagacata ttccaagctt ctgggggtctt cagggcccca gaatttcctg gtcttgggca 180

76

tggtnccacaa gtcatttgtc cttcctcatt ttggaagggt ccatttggac ataaaaatgca 240
 agcgttctcg tgctncatna taatagggtcc cagcctgcac tgacacattt g 300

<210> 247

<211> 471

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(471)

<223> n=A,T,C or G

<400> 247

cactgagtga atgagtatat aatttatgaa aacagaaaag tgctttggaa aaaaaaaaaag 60
 acaacaggag tacatacagn gaacccaaaaa gagggtacca ggaggagcan accctgaaca 120
 gttanaacta tggaaatcgc tatgctttgt gttgtcacag gagttaaata aggaataccc 180
 tgcatacaat aaatatattat tggataaata actaagcctg ataccctttt caatgcgtta 240
 tacanactnt atcatcacac cactaatcta agttctcana agttaaacat tacaagactt 300
 cagaacaaca taggcgtntt tggctccatt taacanaana aggaccatag tgatcattta 360
 atctctatga gtctgtctta tcttctggaa aaggggccta acaccatttc cttttgcaaa 420
 aaggtagctg ccttgccttc agttctacca tccntagca acccatcttt n 480

<210> 248

<211> 551

<212> DNA

<213> Homo sapiens

<400> 248

ccatgggatac aggaatgggg tcagggtcagt tgacctgagc ataccatta aacatgttca 60
 aatgtcccca tcccacccac tcacatgaca tggctccga gccctgagat ctgtatccca 120
 agaacctcag ttgagaaata tttatggcag cttcactgtt gctcaagagc ctgggtattg 180
 tagcagcctg ggggcagggt gtccctaatag ttctccaagt tcttcacatc agccagaatc 240
 ccattctatgc ttgtctccag caaatggagg tggccctct gctgacgtgc cctctcttcc 300
 agctctgaca tcatgggccg cagttggctg ttgatctggg tcttggctcg ggaaagcttc 360
 tgctccagta agaccagccc ctcttcatct acactgagag gctgggtccat cagatgcagg 420
 aggccgtcta atgtgttgag tgtgtcttgg attgtaaccc cagcgttctt ggctctggta 480
 tcaaccttct gggcttctgt aatcaccatc tgtactgcat ccatattcgt gtcgaactcc 540
 agctccttcc t 551

<210> 249

<211> 181

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(181)

<223> n=A,T,C or G

<400> 249

atntccagag ggaccgtaag actggtacaa gtttacacca taagaggcga cgtgggtcagc 60
 cacaatgtct tcacctccac agggggtcat caggnggtc agggcaagg cccccagcat 120
 cagagctttg tttaggatca tctcttccc aaggcagcct tagcagttgc tgacctgccc 180
 g 181

<210> 250
<211> 551
<212> DNA
<213> Homo sapiens

<400> 250
tctgtagcta ggatgagctg gctctcaagc aaaagtttgt cttcctgggt ccatttgtgg 60
ttatcacctg ttattgaatg tacatcacaa attaaagtct gcattgttgg acgtaagaga 120
atgtgccgac tttggtaacc aggagatttc atgttactgg actgcctgta gtcacgtatt 180
tctgctatga cacatccgca atgaaaaata ttaacctgag atttttctag gagatcaacc 240
aaaaataggag gtaattcttc tgcattccaa tattcaagca actctccttc ttcattagggc 300
agtcgaatgg tctcgggaatc tgatccggtt tttcccctga gcattcagaga atatccctca 360
tttccctgggt atagattgac cactaaacat gacaaaagtct cttgcataac aagcttctct 420
aacaagttca catttcttct taatttctta acttcagggt ctttttcaca ttcttcaata 480
tacaagtcac aaagtttttg aaatacagat tttcttccac ttgataggta tttcctttta 540
ggaggtctct g 551

<210> 251
<211> 441
<212> DNA
<213> Homo sapiens

<400> 251
tgtctgctct cccatcctgg ttactatgag tcgctcttgg cagaaaggac cacagatgga 60
gagcttggca ctgctccaa ctttgccgaa aagaggacaa ccaccaagt agtaggtata 120
aacacaattt tagcagcagt gaaataaaaa gaggaagtga ggatggggcc aggccgcaac 180
tataattaaa ctgtctgttt aggagaagct gaatccagaa gaaacacaag ctgtaaagtg 240
agagaggaca gggagcaggg cctttggaga gcaggagagg acaggctgtc accaagcgct 300
gctcggactc tgccctgaaa gatttgaatt ggacactgtc cagtcacgtg tgtggcaaac 360
cgtactccaa gcacttttct caccggcagag gaaggagctg ccatggctgt acccctgaac 420
gtttgtgggg ccagcgatgt g 441

<210> 252
<211> 406
<212> DNA
<213> Homo sapiens

<400> 252
tttttttttg aacaagtaaa aatttcttta tttgctgaca ataagataac ctacagggaa 60
aacctgatga aatctattaa aaagttacta aaactaataa aagaatttag gaagggtata 120
gaatgtaaga ccaagacaca aaaatcaatt acatttctat ataatagcaa tgaacagata 180
ctgaaatttt aaaaactaaa tcattttaca aaagtatcac aatatgaaac actccgggat 240
aaattggata aaagatgtgc aagactgtac aaaagctaca aaacatttat gaaggaaatt 300
ggaagataga aacaagatag aaaatgaaaa tattgtcaag agtttcagat agaaaatgaa 360
aaacaagcta agacaagtat tggagaagta tagaagatag aaaaat 406

<210> 253
<211> 544
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (224)

<223> n=A,T,C or G

<400> 253

```

gaaggagttc agtagcaaag tcacacctgt ccaattccct gagctttgct cactcagcta 60
atgggatggc aaaggtggtg gtgctttcat cttcaggcag aagcctctgc ccatccccct 120
caagggtctg aggccagtt ctcagtctgc ccttggtggt gcactctgta acagaggaga 180
acgtctgggt ggcggcagca gctttgctct gagtgcctac aaanctaag cttggtgcta 240
gaaacatcat cattattaa cttcagaaaa gcagcagcca tggtcagtca ggctcatgct 300
gcctcactgc ttaagtgcct gcaggagccg cctgccaaag tccccctcct acacctggca 360
cactggggtc tgcacaaggc tttgtcaacc aaagacagct tccccctttt gattgcctgt 420
agactttgga gccaaagaaac actctgtgtg actctacaca cacttcaggt gggttgtgct 480
tcaaagtcac tgatgcaact tgaaaggaaa cagtttaatg gtggaaatga actaccattt 540
ataa                                     544

```

<210> 254

<211> 339

<212> DNA

<213> Homo sapiens

<400> 254

```

tggcattcag ggcagtgtct tctgcatctc ctaggaacct cgggagcggc agctccggcg 60
cctggtagcg agaggcgggt tccggagatc ccggcctcac ttcgtccac tggtggttagg 120
ggtgagtcct gcaaatgtta agtgatttgc tcaagggtgc catttcgcag gaattggagc 180
ccaggccagt tctctgagcc tatcattagg gctaaaggag tgcgtgatca gaatggtgtc 240
tggacgggtc tacttgctct gcctgctgct ggggtccctg ggtctatgt gcactcctct 300
cactatctac tggatgcagt actggcgtgg tggctttgc                                     339

```

<210> 255

<211> 405

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(405)

<223> n=A,T,C or G

<400> 255

```

gagggttttt nttttttttt tttttttttt caattaaana tttgatttat tcaagtatgt 60
gaaaacattt tacaatggaa actttnttta aatgctgcat gtncgtgct atggaccacn 120
cacatacagc catgctgttt caaaaaactt gaaatgccat tgatagtta aaaactntac 180
ncccgatgga aaatcgagga aaacaattta atgtttcatn tgaatccana ggngcatcaa 240
attaaatgac agctccactt ggcaaataat agctgttact tgatggtatc caaaaaaaaaa 300
tggttgggga tggataaatt caaaaatgct tccccaagg ngggngggtt ttaaaaagtt 360
tcaggncaca acccttgcan aaaacactga tgcccaacac antga                                     405

```

<210> 256

<211> 209

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (6)

<223> n=A,T,C or G

<400> 256

```
gggcangtct ggctctctcc ccacatgtca cactctctcc agcctctccc ccaaccctgc 60
tctccctcct cccctgccct agcccagggg cagagtctag gaggagcctg gggcagagct 120
ggaggcagga agagagcact ggacagacag ctatggtttg gattggggaa gaggttagga 180
agtaggttct taaagaccct tttttagta 209
```

<210> 257

<211> 343

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(343)

<223> n=A,T,C or G

<400> 257

```
tctggacacc ataatccctt ttaagtggct ggatgggtcac acctctccca ttgacaagct 60
gggttaagtc aataggttga ctaggatcaa caccgaccaa atcaataaga tactgcagtc 120
tattgagact caaaggctta tactggcgctc tgaaactatg tccttcgtta aaccctgatt 180
ttgggattcg gatgtaaaat ggagtctggc ctccctcaaa gcccaagcgg ggccgggttc 240
ctctttgcct ttctccttta tggcctctgc cacattttct acctcttctc cgacctcttg 300
gtcttntctc nggtttcttg gagccgggat tcggctttaa gtn 343
```

<210> 258

<211> 519

<212> DNA

<213> Homo sapiens

<400> 258

```
gcggtctctg acttctagaa gactaaggct ggtctgtgtt tgcttgtttg cccacctttg 60
gctgataccc agagaacctg ggcacttgct gcctgatgcc caccctgcc agtcattcct 120
ccattcaccg agcgggaggt gggatgtgag acagcccaca ttggaaaatc cagaaaaccg 180
ggaacagggg ttgccccttc acaattctac tccccagatc ctctcccctg gacacaggag 240
acccacaggg caggacccta agatctgggg aaaggagggtc ctgagaacct tgaggtagcc 300
ttagatcctt ttctaccac tttcctatgg aggattccaa gtcaccactt ctctcaccgg 360
cttctaccag ggtccaggac taaggcggtt tctccatagc ctcaacattt tgggaatctt 420
cccttaatca cccttgctcc tcttgggtgc ctggaagatg gactggcaga gacctctttg 480
ttgcgttttg tgctttgatg ccaggaatgc cgcctagtt 519
```

<210> 259

<211> 371

<212> DNA

<213> Homo sapiens

<400> 259

```
attgtcaact atatacacag tagtgaggaa taaaatgcac acaaaacaat ggatagaata 60
tgaaaatgtc ttctaaatat gaccagtcta gcatagaacc ttcttctctt ccttctcagg 120
tcttccagct ccattgtcat taaccactt acaaaacgtg gacgtatcgc ttccagaggc 180
cgtcttaaca actccatttc caaaagtcac ctccagaaga catgtatttt ctatgatttc 240
ttttaaacia atgagaattt acaagatgtg taactttcta actctatttt atcatacgtc 300
ggcaacctct ttccatctag aagggtctaga tgtgacaaat gttttctatt aaaagggttg 360
ggtggagttg a 371
```

<210> 260
 <211> 430
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(430)
 <223> n=A,T,C or G

<400> 260
 ttggattttt tgacttgcca ttccagtttt ttactttttt tttttttttt ttttganaaa 60
 tactatatatt attgtcaaaag agtggtacat aggtgagtgt tcatcttccc tctcatgccg 120
 gtatactctg cttcgctgtt tcagtaaaaag ttttccgtag ttctgaacgt cccttgacca 180
 caccataana caagcgcaag tcaactcanaa ttgccactgg aaaactggct caactatcat 240
 ttgaggaaaag actganaaaag cctatcccaa agtaatggac atgcaccaac atcgcggtac 300
 ctacatgttc ccgttttttt gccaatctac ctgtgtttcc aagataaatt accaccagg 360
 gagtcacttc ctgctatgtg aacaaaaacc cggtttcttt ctggaggtgc ttgactactc 420
 tctcgnagac 430

<210> 261
 <211> 365
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (178)
 <223> n=A,T,C or G

<400> 261
 tcctgacgat agccatggct gtaccactta actatgattc tattccaact gttcagaatc 60
 atatcacaaa atgacttgta cacagtagtt tacaacgact cccaagagag gaaaaaaaaa 120
 aaaaaagacg cctcaaaatt cactcaactt ttgagacagc aatggcaata ggagcanag 180
 aagctatgct gcaactgagg gcacatatca ttgaagatgt cacaggagtt taagagacag 240
 gctggaaaaa atctcatact aagcaaacag tagtatctca taccaagcaa aaccaagtag 300
 tatctgctca gcctgccgct aacagatctc acaatcacca actgtgcttt aggactgtca 360
 ccaaa 365

<210> 262
 <211> 500
 <212> DNA
 <213> Homo sapiens

<400> 262
 cctagatgtc atttgggacc cttcacaacc attttgaagc cctgtttgag tccctgggat 60
 atgtgagctg tttctatgca taatggatat tcgggggttaa caacagcccc ctgcttggct 120
 tctattctga atccttttct ttcaccatgg ggtgcctgaa ggggtggctg tgcataatgg 180
 acaatggcac ccagtgtaaa gcagctacaa ttaggagtggt atgtgttctg tagcatccta 240
 tttaaataag cctattttat cctttggccc gtcaactctg ttatctgctg cttgtactgg 300
 tgctgtact tttctgactc tcattgacca tattccacga ccattggtgt catccattac 360
 ttgatcctac tttacatgtc tagtctgtgt ggttgggtgt gaataggctt ctttttacat 420
 ggtgctgcca gccagctaa ttaatggtgc acgtggactt ttagcaagcg ggctcactgg 480
 aagagactga acctggcatg 500

<210> 263
 <211> 413
 <212> DNA
 <213> Homo sapiens

<400> 263
 ctcagagagg ttgaaagatt tgcctacgaa agggacagtg atgaagctaa gctctagatc 60
 caggatgtct gacttcaaatt tgaaactccc aaagtaatga gtttgggaagg gtgggggtgtg 120
 gcctttccag gatgggggtc ttttctgtct ccagcggata gtgaaacccc tgtctgcacc 180
 tgggttgggctg tgttgctttc ccaaagggtt tttttttagg tccgtcgtctg tcttgtggat 240
 taggcattat tatctttact ttgtctccaa ataacctgga gaatggagag agtagtgacc 300
 agctcagggc cacagtgcga tgaggacat cttctcacct ctctaaatgc aggaagaaac 360
 gcagagtaac gtggaagtgg tccacaccta ccgccagcac attgtgaatg aca 420

<210> 264
 <211> 524
 <212> DNA
 <213> Homo sapiens

<400> 264
 tccaatgggg ccctgagagc tgtgacagga actcacactc tggcactggc agcaaaacac 60
 cattccaccc cactcatcgt ctgtgcacct atgttcaaac tttctccaca gttccccaat 120
 gaagaagact catttcataa gtttgtggct cctgaagaag tcctgccatt cacagaaggg 180
 gacattcttg agaaggctcag cgtgcattgc cctgtgtttg actacgttcc cccagagctc 240
 attaccctct ttatctccaa cattgggtggg aatgcacctt cctacatcta ccgcctgatg 300
 agtgaactct accatcctga tgatcatgtt ttatgaccga ccacacgtgt cctaagcaga 360
 ttgcttaggc agatacagaa tgaagaggag acttgagtgt tgctgctgaa gcacatcctt 420
 gcaatgtggg agtgcacagg agtccaccta aaaaaaaaaa tccttgatac tgttgccctgc 480
 ctttttagtc accccgtaac aagggcacac atccaggact gtgt 524

<210> 265
 <211> 344
 <212> DNA
 <213> Homo sapiens

<400> 265
 tcctttcttc tacttcagga gatgattcaa agttacttgt ggacatttct ttaagttctg 60
 aagacaaatg agacaggatt tggcctgcgg gttcttcaga cttctctacc acctccatta 120
 actcttcacg ttggcttgac gtaggcaatg cactattttg ctcttttgtt tctggagatg 180
 acccagcacc acttctttct cttggcgggg ttctaagtgt gtctttgaat accagtgaag 240
 actcaggcct atcctgtact ggaaagggac taaatttgtc tttctgtcta ggaggtgatg 300
 cagtagcatc ctctgagggg ggtaaggcca tttctctttt ttga 344

<210> 266
 <211> 210
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (78)
 <223> n=A,T,C or G

<400> 266
 ccacaatgtc cataacttga gcaggctttg gcacccacc acccccttca gaccaatata 60

```
cactatgttg gaggaacnac tttaaaatgt aaaatgagaa atgggactg aacactccat 120
cctcactccc aacagcccac ccacacacct cttcaactgc tatccaaaca tggaggagct 180
cttgtggaag agaggctcaa caccaaataa 210
```

<210> 267

<211> 238

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(238)

<400> 267

```
tcggnctcc caccctctna ctgaaattct ntgaaattct cccctttggg atgaggatgg 60
caaccccagg catgtaccct cccaacctgg gacccgacct aataccctaa catcctgctg 120
acagtggctg ttctcgctgg gcaggcgctc caaagcacat cgagccagat tcaggcagag 180
tggaactggc ccctcagcca tcagtggagg tggcctggga ggctctacct tgaacggg 240
```

<210> 268

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (459)

<223> n=A,T,C or G

<400> 268

```
tcctcaagga catgcccctt gatagaaact cagttcctgt ctccagttcc ctccctggacc 60
tgatccccc aatgcagggc ctgggactat atccagttcc ttattttcag aggcccatgc 120
acaagatgca cagcaaataa gtgctgaata aagaccacgc tactgctagc ttaccctgct 180
ccaaacattc accaagtcct cagcaaagag ggccatccat tcacctcttc taaaaacaca 240
ctgagctccc cagtctatac cccaagatat gcttggctcc caactatccc tcctctctca 300
tctccaagc agtttcccct ttctaagtat actgatatta ccaaagacac tgacaatctt 360
cttttccctac ctctccccag tgactagggt tgcagcagga gctctataag tcctagtata 420
cagcagaagc tccataaatg tgtgctgacc taacattang c 461
```

<210> 269

<211> 434

<212> DNA

<213> Homo sapiens

<400> 269

```
ctgtgttggt gagcaccgat tcccactcaa tatggcggtg cttacagtct tcattaggtt 60
cccgtccca accagaatga ggaatgatca cttcatctgt caaggcatgc agtgcattgt 120
ccacaatctc cattttgatt gagtcatggg atgaaagatt ccacagggtt ccggtaataa 180
cttcagtaag gtccatatca cgagcctttc gaagcaatcg cacaagggtc ggcacaccat 240
cacagttttt tatggcaatc ttgttatcct ggtcacgtcc aaaagagata ttcttgagag 300
ctccacaggc tccaaggtgc acttcctttt tgggatgggc taacaatccc accagtactg 360
ggatgccctt gagcttccgc acgtcagctc tcaccttgct attgcggtag cataagtgtt 420
gcagggtatgc aaga 434
```

<210> 270

<211> 156
<212> DNA
<213> Homo sapiens

<400> 270
ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60
ccagtagaac cagaatcaga caggtatgag ctagtcaaca gcaagtcttt gttggattcg 120
agtaggctca ggatctgctg aaggctcggag gagtta 156

<210> 271
<211> 533
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(533)
<223> n=A,T,C or G

<400> 271
ccactgtcac ggtctgtctg acacttactg ccaaacgcat ggcaaggaaa aactgcttag 60
tgaagaactt agaagctgtg gagaccttgg ggtccacgtn caccatctgc tctgataaaa 120
ctggaactct gactcanaac cggatgacag tggcccacat gtggtttgac aatcaaattc 180
atgaagctga tacgacagag aatcagagtg gtgtctcttt tgacaagact tcagctacct 240
ggcttgctct gtccagaatt gcaggtcttt gtaacagggc agtgtttcag gctaaccagg 300
aaaacctacc tattcttaag cgggcagttg caggagatgc ctctgagtca gcactcttaa 360
agtgcataga gctgtgctgt ggntncgtga aggagatgag agaaagatac nccaaaatcg 420
tcgagatacc cttcaactcc accaacaagt accagttgtc tattcataag aacccaaca 480
catcggagcc ccaacacctg ttggtgatga agggcgcccc agaaaggatc cta 540

<210> 272
<211> 630
<212> DNA
<213> Homo sapiens

<400> 272
tgggtattttt ctttttcttt tggatgtttt atactttttt ttcttttttc ttctctattc 60
ttttcttcgc cttcccgtag ttctgtcttc cagttttcca cttcaaactt ctatcttctc 120
caaattgttt catcctacca ctcccaatta atctttccat ttctgtctgc gtttagtaaa 180
tgcgttaact aggttttaaa tgacgcaatt ctccctgcgt catggatttc aaggctcttt 240
aatcaccttc ggtttaatct ctttttaaaa gatcgccctc aaattatttt aatcacctac 300
aacttttaaa ctaaacttta agctgtttta gtcaccttca ttttaattcta aaagcattgc 360
ccttctattg gtattaattc ggggctctgt agtcctttct ctcaattttc ttttaaatac 420
attttttact ccatgaagaa gcttcatctc aacctccgct atgtttttaga aaccttttat 480
cttttcttct ctcagtctac tcttctaagt cttcatattt tctcttaaaa tcttaagcta 540
ttaaaattac gttaaaaaact taacgctaag caatatctta gtaacctatt gactatattt 600
tttaagtagt tgtattaatc tctatctttc 630

<210> 273
<211> 400
<212> DNA
<213> Homo sapiens

<400> 273
tctggtttgc cctccagttc attctgaatc tagacttgct cagcctaacc aagttcctgt 60

```

acaaccagaa ggcacacagg ttcctttggt atcatccaca agtgaggggt acacagcatc 120
tcaacccttg taccagcctt ctcattgtac agagcaacga ccacagaagg aaccaattga 180
tcagattcag gcaacaatct ctttaaatac agaccagact acagcatcat catcccttcc 240
tgctgcgtct cagcctcaag tatttcaggc tgggacaagc aaacctttac atagcagtgg 300
aatcaatgta aatgcagctc cattccaate catgcaaagc gtgttcaata tgaatgcccc 360
agttcctcct gttaatgaac cagaaacttt aaaacagcaa 400

```

<210> 274

<211> 351

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (2)

<223> n=A,T,C or G

<400> 274

```

tntgagtatg tcccagagaa ggtgaagaaa gcggaaaaga aattagaaga gaatccatat 60
gaccttgatg cttggagcat tctcattcga gaggcacaga atcaacctat agacaaaagca 120
cggaagactt atgaacgcct tggtgcccag ttccccagtt ctggcagatt ctggaaactg 180
tacattgaag cagaggttac tattttatct tattttttct tatatcagta ttgcagcatt 240
cactgtagtg atagaaaaca agtttagaac atagccaatt aggacaagga ggatttaaata 300
gtgtcttacc tttattttgt aaaataggta taaaggagta attaaaaatga a 360

```

<210> 275

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(381)

<223> n=A,T,C or G

<400> 275

```

gcgngggtcgc nnncgaggctc tgagaagccc ataccactat ttgttgagaa atgtgtggaa 60
tttattgaag atacaggggtt atgtaccgaa ggactctacc gtgtcagcgg gaataaaact 120
gaccaagaca atattcaaaa gcagtttgat caagatcata atatcaatct agtgtcaatg 180
gaagtaacag taaatgctgt agctggagcc cttaaagctt tctttgcaga tctgccagat 240
cctttaattc catattctct tcatccagaa ctattggaag cagcaaaaat cccggataaa 300
acagaacgtc ttcattgcctt gaaagaaatt gttaagaaat ttcattcctgt aaactatgat 360
gtattcagat acgtgataac a 381

```

<210> 276

<211> 390

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (5)

<223> n=A,T,C or G

<400> 276


```

gctcngactc cggcgggacc tgctcggagg aatggcgccg ccgggttcaa gcactgtctt 60
cctgttggcc ctgacaatca tagccagcac ctgggctctg acgcccactc actacctcac 120
caagcatgac gtggagagac taaaagcctc gctggatcgc cttttcacia atttggaatc 180
tgctttctac tccatcgtgg gactcagcag ccttggtgct caggtgccag atgcaaagaa 240
agcatgtacc tacatcagat ctaaccttga tcccagcaat gtggattccc tcttctacgc 300
tgcccaggcc agccaggccc tctcaggatg tgagatctct atttcaaag agaccaaaga 360
tctgcttctg gcagacctcg gccgcgacca 390

```

<210> 277

<211> 378

<212> DNA

<213> Homo sapiens

<400> 277

```

tgggaaacttc tggggtagga cgttgtctgc tatctccagt tccacagacc caaccagtta 60
cgatggtttt ggaccattta tgccgggatt cgacatcatt ccctataatg atctgcccgc 120
actggagcgt gctcttcagg atccaaatgt ggctgcgttc atggtagaac caattcaggg 180
tgaagcaggc gttgttggtc cggatccagg ttacctaatg ggagtgcgag agctctgcac 240
caggcaccag gttctcttta ttgctgatga aatacagaca ggattggcca gaactggtag 300
atggctggct gttgattatg aaaatgtcag acctgatata gtctctcttg gaaaggccct 360
ttctgggggc ttataccc 378

```

<210> 278

<211> 366

<212> DNA

<213> Homo sapiens

<400> 278

```

ggaggggcaca ttctttttca cctcagagtc ggtcggggaa ggccacccag ataagatttg 60
tgaccaaacc agtgatgctg tccttgatgc ccaccttcag caggatcctg atgccaaagt 120
agcttggtgaa actggttgcta aaactggaat gatccttctt gctggggaaa ttacatccag 180
agctgctgtt gactaccaga aagtgggttcg tgaagctgtt aaacacattg gatatgatga 240
ttcttccaaa ggttttgact acaagacttg taacgtgctg gttagccttg agcaacagtc 300
accagatatt gctcaagggtg ttcattctga cagaaatgaa gaagacattg gtgctggaga 360
ccaggg 366

```

<210> 279

<211> 435

<212> DNA

<213> Homo sapiens

<400> 279

```

cctaagaact gagacttggt acacaaggcc aacgacctaa gattagccca gggttgtagc 60
tggaagacct acaacccaag gatggaaggc cctgtgcaca aagcctacct agatggatag 120
aggacccaag cgaaaaagat atctcaagac taacggccgg aatctggagg cccatgaccc 180
agaacccagg aaggatagaa gcttgaagac ctgggggaaat cccaagatga gaaccctaaa 240
ccctacctct tttctattgt ttacacttct tactcttaga tatttccagt tctcctgttt 300
atctttaagc ctgattcttt tgagatgtac tttttgatgt tgccgggttac ctttagattg 360
acaagtatta tgcttgcca gtcttgagcc agctttaaat cacagctttt acctatttgt 420
taggctatag tgttt 435

```

<210> 280

<211> 435

<212> DNA

<213> Homo sapiens

<400> 280

```
tctggatgag ctgctaactg agcacaggat gacctggggac ccagcccagc ccccccgaga 60
cctgactgag gccttcctgg caaagaagga gaaggccaag gggagccctg agagcagctt 120
caatgatgag aacctgcgca tagtggtggg taacctgttc cttgccggga tggtagaccac 180
ctcgaccacg ctggcctggg gcctcctgct catgataccta cacctggatg tgcagcgtga 240
gcccagacct gtccggggcg ccgctcgaaa ttccagcaca ctggcgggcg ttactagtgg 300
atccgagctc ggtaccaagc ttggcgtaat catggtcata gctgtttcct gtgtgaaatt 360
gttatccgct cacaattcca cacaacatac gagccggaag cataaagtgt aaagcctggg 420
gtgcctaata agtga 435
```

<210> 281

<211> 440

<212> DNA

<213> Homo sapiens

<400> 281

```
catctgatct ataaatgcgg tggcatcgac aaaagaacca ttgaaaaatt tgagaaggag 60
gctgctgaga tgggaaaggg ctccctcaag tatgcctggg tcttggataa actgaaagct 120
gagcgtgaac gtggtatcac cattgatatc tccttgtgga aatttgagac cagcaagtac 180
tatgtgacta tcattgatgc cccaggacac agagacttta tcaaaaacat gattacaggg 240
acatctcagg ctgactgtgc tgtcctgatt gttgctgctg gtgttgggtg atttgaagct 300
ggtatctcca agaatgggca gaccgagag catgcccttc tggcttacac actgggtgtg 360
aaacaactaa ttgtcgggtg taacaaaatg gattccactg agccccctac agccagaaga 420
gatatgagga aattgttaag 440
```

<210> 282

<211> 502

<212> DNA

<213> Homo sapiens

<400> 282

```
tctgtggcgc aggagcccc tccccgggca gctctgacgt ctccaccgca gggactggtg 60
cttctcggag ctccactcc tcagactccg gtggaagtga cgtggacctg gateccactg 120
atggcaagct ctccccagc gatggttttc gtgactgcaa gaagggggat cccaagcacg 180
ggaagcggaa acgaggccgg ccccgaaaag tgagcaaaga gtactgggac tgtctcgagg 240
gcaagaagag caagcacgcg cccagaggca cccacctgtg ggagttcac cgggacatcc 300
tcatccaccc ggagctcaac gagggcctca tgaagtggga gaatcggcac gaaggcgtct 360
tcaagttcct gcgctccgag gctgtggccc aactatgggg ccaaaagaaa aagaacagca 420
acatgaccta cgagaagctg agccggggca tgagggtacta ctacaaacgg gagatcctgg 480
aacgggtgga tggccggcga ct 502
```

<210> 283

<211> 433

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(433)

<223> n=A,T,C or G

<400> 283

```
ccatattaga ttactggaac atctaagcat cagtgtgtga ccatgcgaac aaaagacttc 60
ggggagtgtc tatttttaaa aaggtttatg tgtgtcgagg cagttgtaaa agatttactg 120
```

```

cagaatcaan cccactttta ggcttangac cagggttctaa ctatctaaaa atattgactg 180
ataacaaaaa gtgttctaaa tgtggctatt ctgatccata nttgnttttt aaagaaaaaa 240
antgtntata cagaaagagt ntaaaaagttc tgtgaattna atgcaaatta gncnccantc 300
ttgacttccc aaanacttga ttnatacctt tnaactcctnt cnnttcctgn ncttcnttaa 360
nntcaatnat tnggnagttn anggcctctn gnanaacacc nttncncgnt ccncgcaatc 420
canccgcctt nan 433

```

<210> 284

<211> 479

<212> DNA

<213> Homo sapiens

<400> 284

```

tctggaagga tcagggatct gagcaaagcc aagtttactt aagctaagcc acttggttcct 60
gggtcaagca gtttggtttc taataagcat cattcctgat cattagagca aagggatgaa 120
tgctcctctt ggaatgatac aggggatctg ccactgggag agtggtgctc agtgtagag 180
tagcagcaat gacagaatga cagcgactct ctgagtcaac ccagtacttt tagtaccctg 240
tcactatgtg aataaaggca gctagaaaat ggactcaatt ctgcaagcct tcatggcaac 300
agcccatatt aagacttcta gaacaagtta aaaaaaaatc ttccatttcc atccatgcat 360
gggaaaagggt ctttagtata gtttaggatg gatgtgtgta taataataaa atgataagat 420
atgcatagtg ggggaataaa gcctcagagt ccttcacagta tggggaatcc attgtatct 480

```

<210> 285

<211> 435

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(435)

<223> n=A,T,C or G

<400> 285

```

tttttttttt tttttttttt tcaatanaaa tgccataatt tattccattg tataaaaaag 60
tcatecttat gtaacaaaat gtnttcttan aanaanaaat atattatttc aggtcataaa 120
taatcagcaa acatacaact gttggcaact aaaaaaaaaa ccaacactgg tattttccat 180
cagngctgaa aacaaacctg cttaaanata tatttacagg gatagtnacg tntcaaaaa 240
caaaaattga ggtatttttg ttcttctagg agtagacaat gacatttttg gangggcaga 300
cccctnnccc aaaaaataaa ataagggnat nttcttcant atngaanann gggggcgccc 360
cggggaaaaa naaaccttgg gnnggggggt tggcccaagc ccttgaaaaa aaantttntt 420
tcccaaaaaa aacng 435

```

<210> 286

<211> 301

<212> DNA

<213> Homo sapiens

<400> 286

```

cctggtttct ggtggcctct atgaatccca tgtaggggtg agaccgtact ccatecctcc 60
ctgtgagcac cacgtcaacg gctcccggcc cccatgcacg ggggagggag ataccccaa 120
gtgtagcaag atctgtgacg ctggctacag cccgacctac aaacaggaca agcactacgg 180
atacaattcc tacagcgtct ccaatagcga gaaggacatc atggccgaga tctacaaaaa 240
cggccccgtg gagggagctt tctctgtgta ttcggacttc ctgctctaca agtcaggagt 300
g 301

```

<210> 287
<211> 432
<212> DNA
<213> Homo sapiens

<400> 287
tccagcttgt tgccagcatg agaaccgcca ttgatgacat tgaacgccgg gactggcagg 60
atgacttcag agttgccagc caagtcagcg atgtggcggg acagggggac ccccttctca 120
acggcaccag ctttgccagc ggcaagggac acccccagaa tggcgttcgc accaaactta 180
gatttatatt ctgttccatc catctcgatc atcagtttgt caatcttctc ttgttctgtg 240
acgttcagtt tcttgctaac cagggcaggc gcaatagttt tattgatgtg ctcaacagcc 300
tttgagacac ctttcccatc atagcgagtc ttatcattgt cccggagctc tagggcctca 360
tagataccag ttgaagcacc actgggcaca gcagctctga agagacctt tgagggtgaag 420
agatcaacct ca 432

<210> 288
<211> 326
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (254)
<223> n=A,T,C or G

<400> 288
tctggctcaa gtcaaagtc ttggtcctct ctccgcctcc ttcttcatca tagtaataaa 60
cgttgtcccg ggtgtcatcc tctgggggca gtaagggctc ttgaccacc gctctcctcc 120
gaagaaacag caagagcagc agaatcagaa ttagcaaagc aagaattcct ccaagaatcc 180
ccagaatggc aggaatttgc aatcctgctt cgacaggctg tgcttctcta cagacgccgg 240
cggcccttcc acantcacac acgtgacct ctaaggtggt cacttgggtc ttattctggt 300
tatccatgag cttgagattg attttg 326

<210> 289
<211> 451
<212> DNA
<213> Homo sapiens

<400> 289
gtcccgggtg ggctgtgccg ttggtcctgt gcggctcactt agccaagatg cctgaggaaa 60
cccagaccca agaccaaccg atggaggagg aggaggttga gacgttcgcc tttcaggcag 120
aaattgcccc gttgatgtca ttgatcatca ataccttcta ctgaacaaa gagatctttc 180
tgagagagct catttcaaat tcatcagatg cattggacaa aatccggtat gaaagcttga 240
cagatcccag taaattagac tctgggaaag agctgcatat taaccttata ccgaacaaac 300
aagatcgaac tctcactatt gtggatactg gaattggaat gaccaaggct gacttgatca 360
ataaccttgg tactatcgcc aagtctggga ccaaagcgtt catggaagct ttgcaggctg 420
gtgcagatat ctctatgatt ggacctcggc c 451

<210> 290
<211> 494
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (421)

<223> n=A,T,C or G

<400> 290

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tttttttttt tcaaaacagt atatttttatt ttacaatagc aaccaactcc ccagtttggt 60
tcaattgtga catctagatg gcttaagatt actttctggg ggtcacccat gctgaacaat 120
atttttcaat cttccaaaca gcaaagactc aaaagagatt ctgcatttca catcagttca 180
caagttcaag agtcttccat ttatcttagc ttttggaata aattatcttt gaggtagaag 240
gacaatgacg aagccactta attccttggtg tctgcataaa agcagattta ttcatacaaa 300
cttcatttat gtgaataaaag cagatgatga taaaatgttc tcttattctt gtttaatcag 360
tagtggtagt gatgccagaa acttgtaaata gcacttcaaa ccaattgtgg ctcaagtgtg 420
ngtggttccc caaggctggt accaatgaga ctgggggttg ggaattagtt ggtcatcatc 480
cctcctgctg ccca 494
```

<210> 291

<211> 535

<212> DNA

<213> Homo sapiens

<400> 291

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tcgcgtgctt aacatgaaaa caaactttgt gctgtttggt tcattgtatg cattgatgga 60
gtcttgcttc tcatcatggg gtgtctgacc atccaacctg cagtactcat aatttctcca 120
catgcaataa tcttccaaaa tgtccaatac ccttgctcatt tgactgaaga ttagtactcg 180
tgaacctgtg tcttttaact tagggagcag cttgtctaaa accaccattt tgccactgtt 240
ggttactaga tgcataatctg ttgtataagg tggaccaggt tctgctccat caaagagata 300
tggatgatta caacattttc tcaactgcat taggatgttc aataacctca tttgtccat 360
cttgctgctg gagttgagta tatctatata cttcattaat atccgagtat accattccct 420
ttgcattttg ctgaggccca catagatttt tacttccttc tttggaggca aactcttttc 480
aacatcagcc ttaattcgac gaaggaggaa tggacgcaaa accatatgaa gcctc 540
```

<210> 292

<211> 376

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(376)

<223> n=A,T,C or G

<400> 292

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tacnagcccc tgctgatcga gatcctgggtg gaggtgatgg atccttcctt cgtgtgcttg 60
aaaattggag cctgcccctc ggcccataag cccttggttg gaactgagaa gtgtatatgg 120
ggcccaagct actggtgcca gaacacagag acagcagccc agtgcaatgc tgtcgagcat 180
tgcaaacgcc atgtgtggaa ctaggaggag gaatattcca tcttggcaga aaccacagca 240
ttggtttttt tctacttggtg tgtctggggg aatgaacgca cagatctggt tgactttggt 300
ataaaaatag ggctccccca cctcccccat ttttgtgtcc tttattgnag cattgctgtc 360
tgcaaggagg ccccta 376
```

<210> 293

<211> 320

<212> DNA

<213> Homo sapiens

<400> 293

90

```

tcggctgctt cctggctctgg cggggatggg tttgctttgg aaatcctcta ggaggctcct 60
cctcgcatgg cctgcagtct ggcagcagcc ccgagttggt tcctcgctga tcgatttctt 120
tcctccaggt agagttttct ttgcttatgt tgaattccat tgctcttttt ctcatcacag 180
aagtgatggt ggaatcggtt cttttgtttg tctgatttat ggttttttta agtataaaca 240
aaagtttttt attagcattc tgaaagaagg aaagtaaaat gtacaagttt aataaaaagg 300
ggccttcccc tttagaatag                                     320

```

<210> 294

<211> 359

<212> DNA

<213> Homo sapiens

<400> 294

```

ctgtcataaaa ctggctctgga gtttctgacg actccttggt caccaaatgc accatttcct 60
gagacttgct ggctctctccg ttgagtcac ttggctttct gtctccaca gctccattgc 120
cactgttgat cactagcttt ttcttctgcc cacaccttct tcgactgttg actgcaatgc 180
aaactgcaag aatcaaagcc aaggccaaga gggatgccaa gatgacagc cattctggaa 240
tttggggtgt ccttatagga ccagagggtg tgtttgctcc accttcttga ctcccatgtg 300
agtgtccatc tgattcagat ccatgagtgg tatgggaccc cccactgggg tggaatgtg 360

```

<210> 295

<211> 584

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (558)

<223> n=A,T,C or G

<400> 295

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cctgagttgg gctgactgcc agagacagac ccctctgggt ctcggtgaac cagccaggca 60
tttacctcag tgggtggcac ctggaacctg tccagggccc tcacctgact gaggagccgc 120
cgggcagtga agtaattgtc cagggtctatg ctcttggggg ggataccata gccatccaag 180
gtattcctca ggttggtgaa ctgggtctga gtataggcag aactgggccc caggatgac 240
tcccgagtg ggggaagctg tgaggtcagg taagtatcca cgccaccgg taccccaatc 300
aaactcagca gaatggtgaa ctggagaagt ccttcggtta agtatttctt cagagaaaagc 360
attgctgaag gaccagaatg tttatgcttt ttgggtttta aaatcttcca aaagacaaat 420
caaggccaact gctctgccgc tccagccagc aggttacct cctcagtgtc aaaccccgta 480
ccccaccctg gcagaacaca agggatgagc tccctgacgg ccccagagga aagcacaccc 540
tgtggagcca aggccaanga cacactccag accacattca cttt                                     584

```

<210> 296

<211> 287

<212> DNA

<213> Homo sapiens

<400> 296

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ccttatcatt cattcttagc tcttaattgt tcattttgag ctgaaatgct gcatttttaat 60
tttaaccaa acatgtctcc tatcctggtt ttgtagcct tcctccacat cctttctaaa 120
caagatttta aagacatgta ggtgtttgtt catctgtaac tctaaaagat cctttttaaa 180
ttcagtccta agaaagagga gtgcttgctc cctaagagtg tttaatggca aggcagccct 240
gtctgaagga cacttctgc ctaagggaga gtggtatttg cagacta                                     287

```

<210> 297

<211> 457
<212> DNA
<213> Homo sapiens

<400> 297
ccaattgaaa caaacagttc tgagaccgtt cttccaccac tgattaagag tgggggtggca 60
ggtattaggg ataatatcca tttagccttc tgagctttct gggcagactt ggtgaccttg 120
ccagctccag cagccttctt gtccactgct ttgatgacac ccaccgcaac tgtctgtctc 180
atatcacgaa cagcaaagcg acccaaaggt ggatagtctg agaagctctc aacacacatg 240
ggcttgccag gaaccatatc aacaatggca gcatcaccag acttcaagaa tttagggcca 300
tcttcagct ttttaccaga acggcgatca atcttttctc tcagctcagc aaacttgcac 360
gcaatgtgag ccgtgtggca atccaatata ggggcatagc cggcgcttat ttggcctgga 420
tggttcagga taatcacctg agcagtgaag ccagacc 457

<210> 298
<211> 469
<212> DNA
<213> Homo sapiens

<400> 298
tctttgactt tccttgtcta cctcctctgg agatctcaaa ttctccaggt tccatgctcc 60
cagagatctc aatgattcct gattctcctc ttccaggagt ctgaatgtct cttgggtcac 120
ttccacagac tccagtgggt cttgaatttc cttttctaga ggattcattg cccctgatt 180
tatttcttct ggagtccaca gtggtgcttg agtttctgga gatttcagtg tttccaggtt 240
ctcttgctcc gcagacttca gtgattctag gatctctgtt tctaaagatt ttactgcctc 300
tatgctctct tctttgagtg actttaagaa ccttgatctc tcattttcaa gaggtctagc 360
tatctcctgg tcaagagact tcagtgggtc tagatccact tttctggggg gtcttaatgt 420
catctgatcc tgttccccta gagacctccg tcgctgttga gtctctttt 469

<210> 299
<211> 165
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(165)
<223> n=A,T,C or G

<400> 299
tctgtggaga ggatgaggtt gagggaggtg gggatatntcg ctgctctgac cttaggtaga 60
gtcctccaca gaagcatcaa antggactgg cacatatgga ctcccttcac aggccacaat 120
gatgtgtctc tccttcgggc tggnccggtg tgcacagttg gggtg 165

<210> 300
<211> 506
<212> DNA
<213> Homo sapiens

<400> 300
tctgaggaaa gtttgggctt attagtattt gctccagcga acctccaagt tttctccatt 60
gcggacaacg taactaccag ctcccttggt cagtgggttcg cctccactca gaagtcccca 120
gtagggtctg tcattattgt tggcacatag gccctgaata cagggtgatat agggccccc 180
tgagcgtccc tccattgtga aaccaaatat agtatcattc attttctggg ctttctccat 240
cacactgagg aagacagaac catttagcac agtgacattg gtgaaatag tttcattgat 300

```

tctcacagag taattgacgg agatatatga ttgtgagtcg ggaggtgtca cagttatagg 360
ctcatcagcg gagatgttga agttacctga agcagagacg caagaagagt ctttgttaat 420
atccaagaag gtctttccca tcagggcagg taagacctgg gctgcagcgt ttggattgct 480
gaatgctcct tgagaaattt ccgtga 506

```

<210> 301

<211> 304

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(304)

<223> n=A,T,C or G

<400> 301

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tcctaaggca gagcccccat cacctcaggg ttctcagttc ccttagccgt cttactcaac 60
tgcccccttc ctctccctca gaatttgtgt ttgctgcctc tatcttgttt tttgtttttt 120
cttctgtgggg ggggtctagaa cagtgcctgg cacatagtag gcgctcaata aatacttgtt 180
tgttgaatgt ctctctctc tttccactct gggaaaccta ngnttctgcc attctgggtg 240
accctgtatt tntttctggg gccattcca tttgnccagn taatacttcc tcttaaaaaat 300
ctcc 304

```

<210> 302

<211> 492

<212> DNA

<213> Homo sapiens

<400> 302

```

ttttcagtaa gcaacttttc catgctctta atgtattcct ttttagtagg aatccggaag 60
tattagattg aatggaaaag cacttgccat ctctgtctag gggtcacaaa ttgaaatggc 120
tcctgtatca catacggagg tcttgtgtag ctgtggcaac agggagtttc cttattcact 180
ctttattttg tgctgtttta gttgccaacc tccccccca ataaaaattc acctacacct 240
ctgcctttg tagttctggg attcacttta ctatgtgata gaagtagcat gttgctgcca 300
gaatacaagg attgcttttg gcaaattaaa gtgcagtgtc tttcttaata cactagaaag 360
gggaaataaa ttaaagtaca caagtccaag tctaaaactt tagtactttt ccatgcagat 420
ttgtgcacat gtgagagggg gtccagtttg tctagtgtat gttatttaga gagttggacc 480
actattgtgt gt 492

```

<210> 303

<211> 470

<212> DNA

<213> Homo sapiens

<400> 303

```

tctggggcag caggtactcc ctacggcact agtctacagg gggaaggacg ctctgtgctg 60
gcagcgggtg ctcatatggc ctgtctgcac tgtaaccaca ggctgggatg tagccaggac 120
ttggtctcct tggagacag gtctgatgtt tggccaatcc agtccttcag accctgcctg 180
aaacttgat ctacgtgaa cttaaagaat aaaatgcatt tctaccccca tctcgcccc 240
aggactggca cgacaggccc acggcagatt agatcttttc ccagtactga tcggtgcgtg 300
gaattccagc caccacttct gattcgattc cacagtgate ctgtcctctg agtattttaa 360
agaagccatt gtcacccag tcagtgttcc aggagtggc aaccagccag taggggtgtgc 420
cattctccac tccccagccc aggatgcgga tggcatggac ctcggccg 470

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<210> 304

<211> 79
<212> DNA
<213> Homo sapiens

<400> 304
tgtcccattg ttaactcagc ctcaaattctc aactgtcagg ccctacaaaag aaaatggaga 60
gcctcttctg gtggatgcg 79

<210> 305
<211> 476
<212> DNA
<213> Homo sapiens

<400> 305
tcactgagcc accctacagc cagaagagat atgaggaaat tgtaaggaa gtcagcactt 60
acattaagaa aattggctac aaccccgaca cagtagcatt tgtgccaatt tctgggtgga 120
atggtgacaa catgctggag ccaagtgcta acgtaagtgg ctttcaagac cattgttaaa 180
aagctctggg aatggcgatt tcatgcttac acaaattggc atgcttgtgt ttcagatgcc 240
ttggttcaag ggatggaaag tcacccgtaa ggatggcaat gccagtggaa ccacgctgct 300
tgaggctctg gactgcatcc taccaccaac tcgtccaact gacaagccct tgcgcctgcc 360
tctccaggat gtctacaaaa ttggtggtaa gttggctgta aacaaagttg aatttgagtt 420
gatagagtac tgtctgcctt cataggtatt tagtatgctg taaatatttt taggta 480

<210> 306
<211> 404
<212> DNA
<213> Homo sapiens

<400> 306
tctgtctcgg agctcagggc gcagccagca cacacaggag cccacaggac agccacgtct 60
tcacagaaac tacagaagtc aggacccagg cgaggacctc aggaacaagt gccccctgca 120
gacagagaga cgcagtagca acagcttctg aacaactaca taataatgcg gggagaatcc 180
tgaagaccac tgcattccac aagcactgac aaccacttca ggattttatt tcttccactc 240
taacccccag atccatttat gagaagttag tgaggatggc aggggcatgg aggggtgaagg 300
gacagcaagg atggtctgag ggcctggaaa caatagaaaa tcttcgtcct ttagcatatc 360
ctggactaga aaacaagagt tggagaagag ggggggttgat acta 404

<210> 307
<211> 260
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1) ... (260)
<223> n=A,T,C or G

<400> 307
tcttgcctan acatctgtga gggcctcaag ggctgctgcc tcgactttct ccctagctaa 60
gtccacccgt ccaggagacac agccagggca ctgctctgtg ctgacttcca ctgcagccaa 120
gggtcaaaat gaagcatctg cggaggccag gactccttgg catcggacac agtcagggga 180
aaagccaccc tgactctgca ggacagaggg tctaggggtca tttggcagga gaacactggg 240
gtgccaaagg aagcnancat 260

<210> 308

<211> 449
 <212> DNA
 <213> Homo sapiens

<400> 308
 tctgtgctcc cgactcctcc atctcaggta ccaccgactg cactgggcgg ggccctctgg 60
 ggggaaaggc tccacggggc agggatacat ctcgaggcca gtcacacctt ggaggcagcc 120
 caatcagggtc aaagattttg cccaactggg cggcttcaga gtttccacag aagagaggct 180
 ttcgacgaaa catctctgca aagatacagc caacactcca catgtccaca ggtgttgcat 240
 atgtggactg cagaagaact tcgggagctc ggtaccagag tgtaacaacc ttgatcgttt 300
 cggctggcaa gcctgggtgg ggtgccttgt ccagatatgt ccttaggtcc tggctctacat 360
 gctcaaacac cagggttacc ttgatctccc ggatggttcg ggatgtggca cagacgtcca 420
 tcagccggac aacattggga tgctcaaaa 449

<210> 309
 <211> 411
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (384)
 <223> n=A,T,C or G

<400> 309
 ctgtggaaac ctgggggtgcc gggtaaatgg agaactccag cttggatttc ttgccataat 60
 caactgagag acgttccatg agcagggagg tgaaccaga accagttccc ccaccaaagc 120
 tgtggaaaac caagaagccc tgaagaccgg tgcactgggc agccagcttg cgaattcggg 180
 ccaacacaag gtcaatgatc tccttgccaa tgggtgtagt ccctcgggca tagttattgg 240
 cagcatcttc cttgcctgtg atgagctgct caggggtggaa gagctggcgg taggtgccag 300
 tgcgaacttc atcaatgact gtgggttcca agtctacaaa cacagcccgg ggcacgtgct 360
 tgccagcgcc cgtctcactt gaanaagggt gtttgaagga agtcactctc t 420

<210> 310
 <211> 320
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (250)
 <223> n=A,T,C or G

<400> 310
 tcctcgcca gcttgactcg attagtcctc ataaggtaag caaggcagat ggtggctgac 60
 cgggaaatgc ctgcctggca gtggacaaac acccttcctc cagcattctt gatggagtct 120
 atgaagtcaa tggcctcggt gaaccaggag ctgatgtctg ccttgtgggt gtccctccaca 180
 gggatgctct tgtactggta gtgacctca aaatgggttg gacaattggc tgagacgttg 240
 atcaaggcan ttatgcccaa ggcacccagc atgtccttgc ggggaagcgtg atacgcactg 300
 cccaggtaca gaaagggcag 320

<210> 311
 <211> 539
 <212> DNA
 <213> Homo sapiens

<400> 311

tctggcccat gaagctgaag ttgggagaga tgatgcttcg cctctgcttc acaaactcaa 60
aggcctcgtc cagcttgact cgattagtc tcataaggta agcaaggcag atgggtggctg 120
accgggaaat gcctgcctgg cagtggacaa acacccttcc tccagcattc ttgatggagt 180
ctatgaagtc aatggcctcg ttgaaccagg agctgatgtc tgccttgagg ttgtcctcca 240
cagggatgct cttgtactgg tagtgacct caaaatgggt gggacaattg gctgagacgt 300
tgatcaaggc agttatgcc aaggcatcca gcatgtcctt gcgggaagcg tgatacgcac 360
tgcccaggta cagaaagggc aggatttcca ccgggccacc ctgaaatcca gaaatatcca 420
acattcatca agcttgctca aagccaaggc cagtgcccat acccacaaa actttctgct 480
ggaaaagtca atttcagata ccgagtgaac tcagttctgt tgctggagga taaataaat 540

<210> 312

<211> 475

<212> DNA

<213> Homo sapiens

<400> 312

tcaaggatct tcctaaagcc accatgtgag aggattcggg cgagagtctg agctgtatgg 60
cagaccatgt cctgctgttc tagggatcatg actgtgtgta ctctaaagtt gccactctca 120
caggggtcag tgataccac tgaacctggc aggaacagtc ctgcagccag aatctgcaag 180
cagcgctgt atgcaacgtt tagggccaaa ggctgtctgg tggggttgtt catcacagca 240
taatggccta gtaggccaag gatccagggt gtgaggggct caaagccagg aaaacgaatc 300
ctcaagtcct ttagtagtct gatgagaact ttaactgtgg actgagaagc attttcctcg 360
aaccagcggg catgtcggat ggctgctaag gcatctgca atactttgat atccaaatgg 420
agttctggat ccagttttcg aagattgggt ggcactgttg taatgagaat cttca 480

<210> 313

<211> 456

<212> DNA

<213> Homo sapiens

<400> 313

tccacttaaa ggggtgctct gccaaactggt ggaatcatcg ccacttccag caccacgcca 60
agcctaacat cttccacaag gatcccgatg tgaacatgct gcacgtgttt gttctgggag 120
aatggcagcc catcgagtac ggcaagaaga agctgaaata cctgccctac aatcaccagc 180
acgaatactt cttcctgatt gggccgcccgc tgcctatccc catgtatttc cagtaccaga 240
tcatcatgac catgatcgtc cataagaact ggggtggacct ggcctgggac gtcagctact 300
acatccgggt cttcatcacc tacatccctt tctacggcat cctgggagcc ctccctttcc 360
tcaacttcat caggttcctg gagagccact ggtttgtgtg ggtcacacag atgaatcaca 420
tcgtcatgga gattgaccag gaggacctcg gcccgc 456

<210> 314

<211> 477

<212> DNA

<213> Homo sapiens

<400> 314

tgcgtgggct tctggaagcc tggatctgga atcattcacc agattattct ggaaaactat 60
gcgtaccctg gtgttcttct gattggcact gactcccaca cccccaatgg tggcggcctt 120
gggggcatct gcattggagt tgggggtgcc gatgctgtgg atgtcatggc tgggatcccc 180
tgggagctga agtgcccaa ggtgattggc gtgaagctga cgggctctct ctccgggttg 240
tcctcaccca aagatgtgat cctgaagggt gcaggcatcc tcacgggtgaa aggtggcaca 300
ggtgcaatcg tggaatacca cgggcctggt gtagactcca tctcctgcac tggcatggcg 360
acaatctgca acatgggtgc agaaattggg gccaccactt ccgtgttccc ttacaaccac 420

aggatgaaga agtatctgag caagaccggc cgggaagaca ttgccaatct agctgat 477

<210> 315
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 315
 caggtactgg atgtcaggtc tgcgaaactt cttanatttt gacctcagtc cataaaccac 60
 actatcacct cggccatcat atgtgtctac tgtggggaca actggagtga aaacttcggt 120
 tgctgcaggt ccgtgggaaa atcagtgacc agttcatcag attcatcaga atggtgagac 180
 tcatcagact ggtgagaatc atcagtgatc tctacatcat cagagtcgtt cgagtcaatg 240
 g 241

<210> 316
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 316
 nttntgtgat agtgtggttt atggactgag gncaaaatnt aagaagtttc gcagacctga 60
 catccaancc tgcgcgngcg gncgctcgaa aggnccaatt ctgcagatat ccatcacact 120
 ggcggccgct cgagcatgca tctagagggc ccaattcgcc ctatantgag tnatattaca 180
 attcactggc cgtcnnttta caacgctcgtg actgggaaaa ccctggcggt acccaactta 240
 a 241

<210> 317
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 317
 aggtaccctg ctcancagcc tgggngcctg ggttgtctcc ttgtccatcc actgggtccat 60
 tctgctctgc atttttttgt tcctcttttg gaggttccac tttgggtttg ggctttgaaa 120
 ttatagggct acaantacct cggccgaaac cacnctaagg gcgaattctg cagatatcca 180
 tcacactggc ggnccgctcga gcatgcatct agagggccca attcggcccta tagtgagtcg 240
 t 241

<210> 318
 <211> 241

<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 318
cgngnacaan ntacattgat gganggtntg nggntctgan tntttantta cantggagca 60
ttaatatattt cttnaacgtn cctcaccttc ctgaantaaa nactctgggt tgtagcgctc 120
tgtgctnana accacntnaa ctttacatcc ctcttttggga ttaatccact gcgcggccac 180
ctctgccgcy accacgctaa gggcnaattc tgcagatata catcacactg gcggccgctc 240
n 241

<210> 319
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 319
cagggtactga tcgggtgcgtg gaantccagc caccantntt gattcgattc cacagtgate 60
ctgtcctctg agtatattta agaagccatt gtcacccag tcagtgttcc aggagttggc 120
aaccagccag taggggtgtgc cattctccac tccccagccc aggatgcgga tggcatggcc 180
acccatcatc tctccggtga cgtgttggtta cctcggccgc gaccacgcta agggcgaatt 240
c 241

<210> 320
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 320
ggcaggtacc aacagagctt agtaatntct aaaaagaaaa aatgatcttt ttccgacttc 60
taaacaagtg actatactag cataaatcat tctagtaaaa cagctaaggt atagacattc 120
taataatttg ggaaaaccta tgattacaag tgaaaactca gaaatgcaaa gatgttggtt 180
ttttgtttct cagtctgctt tagcttttaa ctctnnnaan cncatgcaca cttgnaactc 240
t 241

<210> 321
<211> 241
<212> DNA
<213> Homo sapiens

<220>

<221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 321
 angtagcaac agagcttagt aattntaaa aagaaaaaat gatctttttc cgactttctaa 60
 acaagtgaact atactagcat aaatcattct agtaaaacag ctaagggtata gacattctaa 120
 taattttggga aaacctatga ttacaagtga aaactcagaa atgcaaagat gttgggtttt 180
 tgtttctcag tctgcttttag cttttaactc tgggaagcgca tgcacacntg aactctgctc 240
 a 241

<210> 322
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 322
 ggtaccaaca gagcttagta atttctaaaa agaaaaaatg atctttttcc gactttctaaa 60
 caagtgaacta tactagcata aatcattctt ctagtaaaac agctaaggta tagacattct 120
 aataattttgg gaaaacctat gattacaagt aaaaactcag aaatgcaaag atgttggttt 180
 tttgtttctc agtctgcttt agcttttaac tctggaagcg catgcacact gaactctgct 240
 c 241

<210> 323
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 323
 cgagggtactg tcgtatcctc agccttggtc tatttcttta ttttagcttt acagagatta 60
 ggtctcaagt tatgagaatc tccatggctt tcaggggcta aacttttctg ccattctttt 120
 gctcttaccg ggctcagaag gacatgtcag gtgggatacg tgtttctctt tcagagctga 180
 agaaaggggtc tgagctgcgg aatcagtaga gaaagccttg gtctcagtga ctcttgggt 240
 t 241

<210> 324
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 324
 aggtactgtc gtatcctcag ccttggttcta tttctttatt ttagctttac agagattagg 60
 tctcaagtta tgagaatctc catggctttc aggggctaaa cttttctgcc attcttttgc 120
 tcttaccggg ctccagaagga catgtcaggt gggatacgtg tttctctttc agagctgaag 180
 aaaggggtctg agctgcggaa tcagtagaga aagccttggg ctccagtgaact ccttgggttt 240
 c 241

<210> 325
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 325
 ggcaggtaca tttgttttgc ccagccatca ctcttttttg tgaggagcct aaatacatctc 60
 ttcttggggg ccagagtcctc cattcaaggc agtcaagtta agacactaac ttggcccttt 120

cctgatggaa atatttcctc catagcagaa gttgtgttct gacaagactg agagagttac 180
atgttgggaa aaaaaaagaa gcattaactt agtagaactg aaccaggagc attaatgtct 240
g 241

<210> 326

<211> 241

<212> DNA

<213> Homo sapiens

<400> 326

gcagggtacat ttgttttgcc cagccatcac tcttttttgt gaggagccta aatacattct 60
tcctgggggc cagagtcccc attcaaggca gtcaagttaa gacactaact tggccctttc 120
ctgatggaaa tatttcctcc atagcagaag ttgtgttctg acaagactga gagagttaca 180
tgttgggaaa aaaaagaagc attaatctag tagaactgat ccaggagcat taagttctga 240
a 241

<210> 327

<211> 241

<212> DNA

<213> Homo sapiens

<400> 327

ggtaccagac caagtgaatg cgacagggaa ttatttcctg tgttgataat tcatgaagta 60
gaacagtata atcaaaatca attgtatcat cattagtttt ccaactgcctc acactagtga 120
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180
caaggaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tgattatcag 240
g 241

<210> 328

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 328

ggtacnagac caaatgaang ccacagggaa ttatttcctg tgttgataat tcatgaagta 60
gaacantata atcaaaatca attgtatcat cattagtttt ccaactgcctc acactagtga 120
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180
caaggaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tnatcatcan 240
g 241

<210> 329

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

100

<400> 329
ttcagggtcga gttgggtgca gatttgtggt gcntttctgag ccgtctgtcc tgcgccccaaa 60
ngcttcaaag tattattaaa aacatatgga tccccatgaa gccctactac accaaaagttt 120
accaggagat ttggatagga atggggctga tgggcttcac cgtttataaa atccgggctg 180
ctgataagaa gtaaggcttt gaaagcttca gcgcctgctn ctggtcanna ctaaccatan 240
n 241

<210> 330
<211> 241
<212> DNA
<213> Homo sapiens

<400> 330
ttttgtgcag atttgtggtg cgttctgagc cgtctgtcct gcgccaagat gcttcaaagt 60
attattaaaa acatatggat ccccatgaag ccctactaca ccaaagttta ccaggagatt 120
tgatagagaa tggggctgat gggcttcacg gtttataaaa tccgggctgc tgataaaaga 180
agtaaggctt tgaaagcttc agcgctgctc cctggctcac actaaccaga ttactctgga 240
g 241

<210> 331
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1) ... (241)
<223> n = A,T,C or G

<400> 331
nttttaggna ctttgggctc cagacttcac tggctcttagg nattgaaacc atcacctggn 60
ntgcattcct catgactgag gttaacttaa aacaaaaatg gtaggaaagc tttcctatnc 120
ttcnggtaag anacaaatnt nctttaaaaa aangtggaag gcatgacnta cgtgagaact 180
gcacaaactg gccactgaca aaaatgaccc ccatttgtgt gacttcattg agacacatta 240
c 241

<210> 332
<211> 241
<212> DNA
<213> Homo sapiens

<400> 332
tgtgaggaga gggaacatgc tgagaaactg atgaagctgc agaaccaacg aggtggccga 60
atcttccttc aggatatcaa gaaaccagac tgtgatgact gggagagcgg gctgaatgca 120
atggagtgtg cattacattt ggaaaaaat gtgaatcagt cactactgga actgcacaaa 180
ctggccactg acaaaaaatga ccccatcttg tgtgacttca ttgagacaca ttacctgaat 240
g 241

<210> 333
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

101

<222> (1)...(241)

<223> n = A,T,C or G

<400> 333

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caggtacaag cttttttttt tttttttttt tttttttttt ttgnaaatac tntttattgn 60
aaatattcta tcctaaattc catatagcca attaatnttt acanaatntt ttgttaattt 120
ttgngngtat aaatttttaca aaaataaagg gtatgtttgt tgcacacaac ttacaaataa 180
taataaactn tttattgnaa atattnttta ttgnaaatat tctttatcct aaattccata 240
t                                                                 241
```

<210> 334

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 334

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tacctgctgn aggggntgaa gncntctctg ctgccccagg catctgcanc ccctgctgct 60
ggttctgccc ctgctgcagc agaggagaag aaagatgaga agaaggagga gtctgaagag 120
tcagatgatg acatgggatt tggccttttt gattaaannc ctgctcccct gcaaataaag 180
cctttttaca caaaaaaaaa aaaaaaaaaa aaaaaaaaaa aagcttgtac ctgcccnggc 240
g                                                                 241
```

<210> 335

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 335

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ctatgtgctg ggatgactat ggagacccaa atgtctcana atgtatgtcc cagaaacctg 60
tggctgcttc aaccattgac agttttgctg ctgctggctt ctgcagacag tcaagctgca 120
gctcccccaa aggctgtgct gaaacttgag cccccgtgga tcaacgtgct ccaggaggac 180
tctgtgactc tgacatgcca gggggctcgc agccctgaga gcgactccat tcagtgggtc 240
c                                                                 241
```

<210> 336

<211> 241

<212> DNA

<213> Homo sapiens

<400> 336

```
taccaacctt tgcagccaag caacctcagc agttcccatc aaggccacct ccaccacaac 60
cgaaagtatc atctcaggga aacttaattc ctgcccgtcc tgctcctgca cctcctttat 120
atagttccct cacttgattt ttttaacctt ctttttgcaa atgtcttcag ggaactgagc 180
taatactttt ttttttcttg atgttttctt gaaaagcctt tctgttgcaa ctatgaatga 240
a                                                                 241
```

102

<210> 337
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 337
 ggtactgtat gtagctgcac tacaacagat tcttaccgtc tccacanagg tcatanattg 60
 taaatggtna atactgactt tttttttatt cccttgactc aagacagcta acttcatttt 120
 cagaactggt ttaaaccctt gtgtgctggt ttataaaata atgtgtgtaa tccttggtgc 180
 tttcctgata ccagactggt tcccgtgggt ggtagaata tattttgntt tgatgcttat 240
 a 241

<210> 338
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 338
 aggtacaggt gtgcgctgag ccgagtttac acggaaagga taaagcccat ttagttttctt 60
 ctcaaattgga gttttccact ttcttttgaa gtagacagca ttcaccagga tcatcctggg 120
 atccccatct acagaacctt caggtaacaa gtttgggatt ttgcctttgg tttgagtctt 180
 gaccaggaa ttaatctttt ttctagcttc ttctgcacat tctaggaagt ctactgcctg 240
 g 241

<210> 339
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 339
 taccgacggc tcctggaggg agagagtga gggacacggg aagaatcaaa gtcgagcatg 60
 aaagtgtctg caactccaaa gatcaaggcc ataaccagg agaccatcaa cggaagatta 120
 gttctttgtc aagtgaatga aatccaaaag cacgcatgag accaatgaaa gtttccgcct 180
 gttgtaaaat ctattttccc ccaaggaaag tccttgacac gacaccagtg agtgagttct 240
 a 241

<210> 340
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 340
 gtagccctca cacacacatg cccgtaacag gatttatcac aagacacgcc tgcattgtaga 60
 ccagacacag ggcgtatgga aagcacgtcc tcaagactgt agtattccag atgagctgca 120
 gatgcttacc taccacggcc gtctccacca gaaaaccatc gccaaactct gcgatcagct 180
 tgtgacttac aaaccttgtt taaaagctgc ttacatggac ttctgtcctt taaaagcttc 240
 c 241

<210> 341

<211> 241
<212> DNA
<213> Homo sapiens

<400> 341
gtaccgccta ctttcgtctc atgtctccga acttcttgct gatggccgtt ccaacgttgc 60
tgaaagctgc agttgccttt tgccttgcgt gactcagggt ttcattgtgt ttctttagg 120
cagtggtagt ctgcatgtca tgcagcttt tgcagaagt ctgttttaac tcattcatca 180
ggttcatgcc gagttttgtt ttatctcaac tagatgcctt tctttcgtg acaaaacttg 240
t 241

<210> 342
<211> 241
<212> DNA
<213> Homo sapiens

<400> 342
gtacattggg gctataaata taaatgctac ttatgaagca tgaaattaag cttctttttt 60
cttcaagttt tttctcttgc ctagcaatct gttaggcttc tgaaccaaga ccaaagtgtt 120
acgttcctct gctgcatacc aacgttactc caaacaataa aaatctatca tttctgctct 180
gtgctgagga atggaaaatg aaacccccac cccctgaccc ctaggactat acagtggaaa 240
c 241

<210> 343
<211> 241
<212> DNA
<213> Homo sapiens

<400> 343
gtacatgtgg tagcagtaat ttttttgaag caactgcact gacattcatt tgagttttct 60
ctcattatca gattctgttc caaacaagta ttctgtagat ccaaattgat taccagtgtg 120
ctacagactt cttattatag aacagcattc tattctacat caaaaatagt ttgtgtaagt 180
tagttttggg taccatctaa aatattttta aatgttcttt acataaaaat ttatgtttgtg 240
t 241

<210> 344
<211> 241
<212> DNA
<213> Homo sapiens

<400> 344
ggtacaaaat tggtggaatt tagctaataa aaaaacatag taaatattta caaaaacgtt 60
gataacatta ctcaagtcac acacatatata caatgtagac aggtcttaac aaagtttaca 120
aattgaaatt atggagattt cccaaaatga atctaatagc tcattgctga gcatgggtat 180
caatataaca ttttaagatct tggatcaaat gttgtccccg agtcttctgc aatccagtcc 240
t 241

<210> 345
<211> 241
<212> DNA
<213> Homo sapiens

<400> 345
ggtacgaagc tgagcgcacg ggggttgccc cagcgtggag cctggacctc aaacttcacg 60
gaaaatgctc tctctctttg acaggcttcc agctgtctcc taatttctg gatgaactct 120

104

```

ccccggcgat ttaactgac ctgaaaagtg gtgagaggac tgaggaagac aaccaggtca 180
gcgttagatc ggcctctgag ggtggtgcc ttgcctgagg agccaccctt taccaccttg 240
g                                                    241

```

<210> 346

<211> 241

<212> DNA

<213> Homo sapiens

<400> 346

```

caggtaccac tgagcctgag atggggatga gggcagagag aggggagccc cctcttccac 60
tcagttgttc ctactcagac tgttgcactc taaacctagg gaggttgaag aatgagaccc 120
ttaggtttta acacgaatcc tgacaccacc atctataggg tcccaacttg gttattgtag 180
gcaaccttcc ctctctcctt ggtgaagaac atcccaagcc agaaagaagt taactacagt 240
g                                                    241

```

<210> 347

<211> 241

<212> DNA

<213> Homo sapiens

<400> 347

```

aggtacatct aaaggcatga agcactcaat tgggcaatta acattagtgt ttgttctctg 60
atggtatctc tgagaatact ggttgtagga ctggccagta gtgccttcgg gactgggttc 120
acccccaggt ctgcggcagt tgtcacagcg ccagccccgc tggcctccaa agcatgtgca 180
ggagcaaattg gcaccgagat attccttctg ccactgttct cctacgtggt atgtcttccc 240
a                                                    241

```

<210> 348

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 348

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angtacttgg caagattnga tgctcttgng ctcantgaca tcattcataa cttgttngtg 60
tgancagagg aggagnncat catcntgtcc tcattcgtea gnnncctctc ctctctgaat 120
ctcaaacaag ttgataatgg agaaaaattt gaattctcag gattgaggct ggactgggtc 180
cgcctacang catacactag cgtggctaag gccctctgc accctgcatg anaacctga 240
c                                                    241

```

<210> 349

<211> 241

<212> DNA

<213> Homo sapiens

<400> 349

```

gcaggtagca tttgtctgac ctctgtaaaa aatgtgatcc tacagaagtg gagctggata 60
atcagatagt tactgtctacc cagagcaata tctgtgatga agacagtgtc acagagacct 120
gctacactta tgacagaaac aagtgtctaca cagctgtggt ccactcgtg tatgggtggg 180
agaccaaaat ggtggaaaca gccttaacct cagatgcctg ctatcctgac taatttaagt 240

```

C 241

<210> 350
<211> 241
<212> DNA
<213> Homo sapiens

<400> 350
aggtactgtg gatattttaa atatcacagt aacaagatca tgcttggtcc tacagtattg 60
cgggccagac acttaagtga aagcagaagt gtttgggtga ctttcctact taaaattttg 120
gtcatatcat ttcaaaacat ttgcatcttg gttggctgca tatgctttcc tattgatccc 180
aaaccaaadc ttagaatcac ttcattttaa atactgagcg gtattgaata cttcgaagca 240
g 241

<210> 351
<211> 241
<212> DNA
<213> Homo sapiens

<400> 351
tacagaaadc atttggagcc gttttgagac agaagtagag gctctgtcaa gtcaatactg 60
cattgcagct tgggccactg aagaagccac gcctgagata caaaagatgc actacacttg 120
accgcgttta tggtcgcttc ctctcccttc ctctctcacc aactttatta gggtaaaaca 180
ccacatacag gctttctcca aatgactccc tatgtctggg gtttggttag aattttatgc 240
c 241

<210> 352
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 352
gtaccctgtg gagctgcacc aagattannt ggggccatca tgactgcanc cacnacgang 60
acgcaggcgt gnagtgcacc gtctgacctg gaaaccttt cacttctctg ctcccagggt 120
gtcctcnggc tcatatgtgg gaaggcanan gatctctgan gagttncctg gggacaactg 180
ancagcctct ggagaggggc cattaataaa gctcaacatc attggcaaaa aaaaaaaaaa 240
a 241

<210> 353
<211> 241
<212> DNA
<213> Homo sapiens

<400> 353
aggtaccagt gcattaatth gggcaaggaa agtgtcataa tttgatactg tatctgtttt 60
ccttcaaagt atagagcttt tggggaagga aagtattgaa ctggggggtg gtctggccta 120
ctgggctgac attaaactaca attatgggaa atgcaaaaagt tggttggtata tggtagtgtg 180
tggttctctt ttggaattht tttcagggtga ttttaataata atttaaaact actataaaaa 240
c 241

106

<210> 354
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 354
 ngcagggtccg ggcagggtacc aagattcatt ctcatacaaaa actagaaaca gaagggcaaa 60
 ttccagtttc cttctgggat tgaatacttt caagtaaggt cttcgacaaa caatcagggg 120
 gccaaattaat ccactgtaga ggcccttaac ttgatccaca gttgaataat aagcccatgg 180
 aatacaagca gaatcctctg ttccagctcc agatctttct gggattttcc atacgtaagt 240
 g 241

<210> 355
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 355
 ggtacccacc cttaaatttga actcttatca agaggctgat gaatctgacc atcaaatagg 60
 ataggatgga cttttttttg agttcattgt ataaacaaat tttctgattt ggacttaatt 120
 cccaaaggat taggtctact cctgctcatt cactctttca aagctctgtc cactctaact 180
 tttctccagt gtcatagata gggaattgct cactgcgtgc ctagtcttc ttcacttacc 240
 t 241

<210> 356
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 356
 aggtactgta attgagcatc cggaatntgg agaagtaatt tagctacagg gtgaccaacg 60
 caagaacata tgccagttcc tcgtagagat tggactggct aaggacgac agctgaaggt 120
 tcatggggtt taagtgttg tggctcactg aagcttaagt gaggatttcc ttgcaatgag 180
 tagaatttcc cttctctccc ttgtcacagg tttaaaaacc tcacagcttg tataatgtaa 240
 c 241

<210> 357
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 357
 ttttgtacca ccgatatgat caaggaaaat tctgcccatt tttatggctg aagttctaaa 60
 aacctaattc aaagttcttc catgatccta cactgcctcc aagatgggtc aggctggcat 120
 aaggcctgag cggcggtgag atccgcggct gccagcagct tgtcgtctt cagctgggtat 180

gaagcccctc ggccacccga gtctccagga cctgcccggg cgccgctcga aagggcgaat 240
t 241

<210> 358
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 358
aggtacgggg agtgggggtg aagcntgttc tctacatagg caacacagcc gcctaantca 60
caaagtcagt ggtcggccgc ttcgaccaac atgtgggtgag cattccacgg gcgcatgaag 120
tctgggtgct gtgctcgagt ctctgaatat tttgatagga agcgacaaga aaattcaaac 180
tgctctttgc tgactactgg aaagtgaaaa gatgctcaag tttaccattc aaagaaacca 240
t 241

<210> 359
<211> 241
<212> DNA
<213> Homo sapiens

<400> 359
gaggtacaca aaaggaatac cttctgagag ccagggagtg aggaaagggg aaggagactt 60
gacgtcaagg gtgcttttga ggaacatgac gggccagcca gcctgcccna actttgaggc 120
cctgctgggc tcttgtagact ataaatatac tgtctatttc taatgcaatc cgtctttcct 180
gaaagatctt gttatctttt actattgaga catgctttca tttttgtggt cctgtttcca 240
a 241

<210> 360
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 360
ngtactctat actaattctg cctttttata cttaattcta aattttctccc ctctaattta 60
caacaaattt tgtgattttt ataagaatct atgcctcccc aattctcaga ttcttctctt 120
ttctccttta tttctttgct taaattcagt ataagctttc ttggtatttt aggcctcatg 180
cacattctta ttcttaaaca ccagcagttc ttcagagacc taaaatccag tataggaata 240
a 241

<210> 361
<211> 241
<212> DNA
<213> Homo sapiens

<400> 361

108

```

agggtactctc cgtgccccga cactgaacat tatccagcca gatctgcccc gtgccagctc 60
ccacttttgta cttttctttac tatcctgtct agaatcatgt cttatgattt taacagatat 120
agaaccactc ctagaaaaatg ttctttcact ttctcgtttc ctttttaatc tatcatcctg 180
actactgaac ttaaaatctt ttcttccct tttttgttcc tcttttcttt tatcctgttc 240
a                                                                 241

```

```

<210> 362
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 362
agggtactttt atacctngct tangtcagtg acagattttac caatgacaac acaatttttaa 60
aattccaaca catatattac ttgttcctat gaagggcaaa aagtcaatat attttaaatt 120
ttaaaaacag aatggatata atgacctttt tacacatcag tgatatttaa aagacttaaa 180
gagacaatac tatggttgag acactggctt cctattccag ccctaattaa agaaaaaata 240
g                                                                 241

```

```

<210> 363
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 363
ttangtacta aaaacaaaat cctaattctg ttttaaagag ctgggagatg ttaatcatat 60
gtcagttttt tccacgttat aatttcctaa atgcaaactt ttcaatcagg gcagttcaaa 120
ttcattacat cacagtaaata aacagtagcc aactttgatt ttatgcttat aggaaaaaaa 180
atcctgtaga tataaaaaaca gcaaattttg acaaataaaa ctcaaaccat tcatccctaa 240
a                                                                 241

```

```

<210> 364
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<400> 364
ggtacaagca gttagtcttg aaggcccttg ataagaatgt catcttctcc ccactgagca 60
tctccaccgc cttggccttc ctgtctctgg gggcccataa taccaccctg acagagattc 120
tcaaaggcct caagttcaac ctacaggaga cttctgaggc agaaattcac cagagcttcc 180
agcacctcct gcgcaccctc aatcagttca gcgatgagct gcagctgagt atgggaaatg 240
c                                                                 241

```

```

<210> 365
<211> 241
<212> DNA

```


<213> Homo sapiens

<400> 365

```
cgaggtactg agattacagg catgagccac cagccccggc caaaaacatt taaaaaatga 60
ctgtccctgc tcaaatactg cagtaggaaa tgtaatttga catatatcac ttccagaaaa 120
aaactttaaa tctttctata aaatgaattt gatacatcat cagcatgaag tgaagttaaa 180
atctcttaca aagtaaattc aggtatatca acaatgagat ccaaaagtat cggttcaaga 240
t                                                                 241
```

<210> 366

<211> 241

<212> DNA

<213> Homo sapiens

<400> 366

```
ggcaggtaca catcaaacac ttcattgcct aaatgcaggg acatgcttcc atctgaccac 60
ttgactatcc gagcattgct ttctttaatt tcatttcctt cttcatctcg gcgtatcctc 120
catcttatag tattttctac cttaattttt aacctgggtc taccttcttc atccagcatt 180
tcttcatctt caaattcatc ttcataatac tgggctctac acttgagaaa gttgggcagt 240
t                                                                 241
```

<210> 367

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 367

```
gcaggtacaa ataattcctg ttgtnacatt tagtggacgc gattatctgt atacctcaaa 60
ttttaattta agaaagtatc acttaaagag catctcattt tctatagatt gaggcttaat 120
tactgaaaag tgactcaacc aaaaagcaca taacctttta aaggagctac acctaccgca 180
gaaagtcaga tgccctgtaa ataactttgg tctttcaaaa tagtggcaat gcttaagata 240
c                                                                 241
```

<210> 368

<211> 241

<212> DNA

<213> Homo sapiens

<400> 368

```
tttgtacatt gttaatagtg accctcggag gaaatggatt tctcttctat taaaaactct 60
atggtatata agcattacat aataatgcta cttaaccacc ttttgtctca agaattatca 120
ccaaagtttt ctggaaataa gtccacataa gaattaaata tttaaaagggt gaaatgttcc 180
ttattttaac tttagcaaga tcttttcttt ttcattaaga aacactttaa taattttaaa 240
g                                                                 241
```

<210> 369

<211> 241

<212> DNA

<213> Homo sapiens

110

<400> 369
gcaggtaactt tattcttatt tcttatccta tattctgtgt tacagaaaaa ctactaccat 60
aaacaaaaca ccaaccagcc acagcagttg tgtcaagcat gacaattggc ctagtcttca 120
cattttatta gtaagtctat caagtaagag atgaagggtc tagaaaacta gacacaaagc 180
aaccagggtc caaatcacca aggtagatct gtgcttagct aaagggaac acccgaagat 240
t 241

<210> 370
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 370
ngttcacagt gcccctccgg cctcgccatg aggetcttcc tgctgctccc ggtcctgggtg 60
gtgggtctgt cgatcgctctt ggaaggccca gcccagccc aggggacccc agacgtctcc 120
agtgccttgg ataagctgaa ggagtttgga aacacactgg aggacaaggc tcgggaactc 180
atcagccgca tcaaacagag tgaactttct gccaaagatgc gggagtgggtt ttcagaagac 240
a 241

<210> 371
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 371
ggcaggtcac cttgagcctt gcacatgata ctcagattcc tcacccttgc ttaggagtaa 60
aacaatatac tttacagggt gataataatc tccatagtta tttgaagtgg cttgaaaaag 120
gcaagattga cttttatgac attggataaa atctacaaat cagccctcga gttattcaat 180
gataactgac aaactaaatt atttccttag aaaggaagat gaaaggnagt ggagtgtggt 240
t 241

<210> 372
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 372
aggtacagca aagcgaccct tggtgnnata gatcagacgg aaattctctc ccgtcttgnc 60
aatgctgatg acatccatga atccagcagg gtaggttata tcagttcgga ccttgccatc 120
gattttaatg aaccgctgca tgcaaatctt ctttacttca tctcctgtca gggcatactt 180

111

aagtctgttc ctcaggaaaa tgatgagggg gagacactct ctcaacttgt ggggaccggt 240
g 241

<210> 373

<211> 241

<212> DNA

<213> Homo sapiens

<400> 373

tactgaaaca gaaaaaatgt attcccacaa aagctgttac acagcggttt cccgtcccca 60
gaagcagtag aaaatccttag cattccaatg gaaggcatgt atttgtaaaa tattctaaaa 120
tcagctctat agtttccttg tctcttttga taagggatca gacagagggt gtgtccccct 180
tcagcagcta cccttcttga caaactgggc tccaataata cctttcagaa acttacaaga 240
c 241

<210> 374

<211> 241

<212> DNA

<213> Homo sapiens

<400> 374

caggtactaa aacttacaat aaatatcaga gaagccgtta gtttttacag catcgtctgc 60
ttaaagcta agttgaccag gtgcataatt tcccatcagt ctgtccttgt agtaggcagg 120
gcaatttctg ttttcatgat cggaatactc aaatataacc aaacatcttt ttaaaacttt 180
gatttatagc tccatagaaag ttatgttttt taatagtcac tctactctaa tcaggcctag 240
c 241

<210> 375

<211> 241

<212> DNA

<213> Homo sapiens

<400> 375

aggtagaaag gaccagtatc cctacctgaa gtctgtgtgt gagatggcag agaacgggtgt 60
gaagaccatc acctccgtgg ccatgaccag tgctctgccc atcatccaga agctagagcc 120
gcaaattgca gttgccaaata cctatgcctg taaggggcta gacaggattg aggagagact 180
gcctattctg aatcagccat caactcagat tggtgccaat gccaaaggcg ctgtgactgg 240
g 241

<210> 376

<211> 241

<212> DNA

<213> Homo sapiens

<400> 376

ggtacatttt actttccttc tttcagaatg ctaataaaaa acttttgttt atacttaaaa 60
aaaccataaa tcagacaaac aaaagaaacg attccaacat cacttctgtg atgagaaaag 120
aggcaatgga attcaacata agcaaagaaa actctacctg gaggaagaa atcgatcagc 180
gaagaaacaa ctgggggctg ctgccagact gcaggccatg cgaggaggag cctcctagag 240
g 241

<210> 377

<211> 241

<212> DNA

<213> Homo sapiens

112

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 377
tcctttctgt ccaggtgatt cacagactag acctttctta tctctctcct agagttttga 60
cttgggactc tagtgtaag atgatgagcc cgtgcatcag gtcttctgc actttgggtgg 120
aagtctccca gggtaggttt cctatttgaa acagtgggaat catgtttcca gtgataaagt 180
ttaatgacct catccttttt tttttttttc tcatctgcca tttgtgtgtc ttanatgggt 240
t 241

<210> 378
<211> 241
<212> DNA
<213> Homo sapiens

<400> 378
aggtcagcga tcaggtcctt tatgggcagc tgctgggcag cccacaagc ccagggccag 60
ggcactatct ccgctgcgac tccactcagc ccctcttggc gggcctcacc cccagcccca 120
agtcctatga gaacctctgg ttccaggcca gcccttggg gaccctggta accccagccc 180
caagccagga ggacgactgt gtctttgggc cactgctcaa cttccccctc ctgcagggga 240
t 241

<210> 379
<211> 241
<212> DNA
<213> Homo sapiens

<400> 379
tacggagcaa tcgaagaggc atatccacac ttgggggtggc tatagggctg gaaaatgctg 60
aagatgactg ctttctactga ggtcaaggat tgtaatatgt ccagctttgt aaagccatta 120
aagcagaagt ttcttcagt atcttctctc taagaaacac catcacctcc atgtgcctta 180
cagaggcccc ctgcgttctg ctgcattgct tttgcgcaat cccttgatga tgaagatggg 240
c 241

<210> 380
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 380
acgtacacgc agaccgacat gggnnnttca ggcntnagat caaactcaaa acctgnaatg 60
atatccactc tctttttctt aagctcaggg aaatattcca agtagaagtc canaaagtca 120
tcggctaana tgcttcngaa tttgaattca tgcacatagg ccttgaaaaa actgtcaaac 180
tgannctgat caccacacaa gtgggccntn tatgacacaa agcagaaacc tttctcntan 240
g 241

<210> 381

113

<211> 241

<212> DNA

<213> Homo sapiens

<400> 381

```
aggtagaact taatggatta gcttttgggt ttaactgaat atatgaagaa attgggtctg 60
tctaaagaga gggatattca tatggctttt agttcacttg tttgtatttc atcttgattt 120
ttttctttgg aaaataaagc attctatttg gttcagattt ctcagatttg aaaaaggctc 180
tatctcagat gtagtaaaatt atttcctttc agtttgtgaa agcaggattt gactctgaaa 240
g                                                                 241
```

<210> 382

<211> 241

<212> DNA

<213> Homo sapiens

<400> 382

```
gtactgctat aatcaatacg tctgatagac aggtttatcc actatattga ccttacctct 60
aaaaggattg tcataattta tatgctttat gtttacacct atgatacagt tgccttggaa 120
cacaaaattt ttcattgtaa ttaaaaaaag aagagttgtg cagacagaag aaatcaaata 180
taagaaaata acaggagtag ataaatactc tagaattcat atacccttgg aagatggggt 240
t                                                                 241
```

<210> 383

<211> 241

<212> DNA

<213> Homo sapiens

<400> 383

```
ggcagggtaca aagtcttctc tttgcttttt ataattttta agcaaataac acattttaact 60
gtattttaagt ctgtgcaaat aatccttcag aagaaatata caagattctg tttgcagagg 120
tcattttgtc tctcaaagat gattaaatga gtttgtcttc agataaagtg ctccgtgcc 180
gcagaactca aaaggccttc aagctgttca gtaagtgtag ttcagataag actccgtcat 240
a                                                                 241
```

<210> 384

<211> 241

<212> DNA

<213> Homo sapiens

<400> 384

```
ggtacacaaa atacacttgc aagcttgctt acagagacct gttaaacaaa gaacagacag 60
attctataaaa atcagttata tcaacatata aaggagtgtg atttttcagtt tgttttttta 120
agtaaataatg accaaactga ctaaataaga aggcaaaaaca aaaaattatg cttccttgac 180
aaggcctttg gagtaaacaa aatgctttta ggctcctggt gaatgggggt gcaaggatga 240
a                                                                 241
```

<210> 385

<211> 241

<212> DNA

<213> Homo sapiens

<400> 385

```
ggcagggtcta caatggctct gtcccttctg tggaaatcgtt acaccaagag gtctcagtc 60
tggtccttga cccacagtg agctgttttag atgatacttc acatcttctt gatcaactgg 120
```

114

aagacactcc aatcctcagt gaagactctc tggagccctt caactctctg gcaccaggta 180
ggtttggagg ctatgtccct ttaacttata catgcagagt agccaaactt tacctgaaag 240
a 241

<210> 386

<211> 241

<212> DNA

<213> Homo sapiens

<400> 386

aggtaacctt ttcctctcca aaggaacagt ttctaaagtt ttctgggggg aaaaaaact 60
tacatcaaat ttaaaccata tgtaaactg catattagtt gtgttacacc aaaaaattgc 120
ctcagctgat ctacacaagt ttcaaagtca ttaatgcttg atataaattt actcaacatt 180
aaattatctt aaattattaa ttaaaaaaaaa aactttctaa gggaaaaata aacaaatgta 240
g 241

<210> 387

<211> 241

<212> DNA

<213> Homo sapiens

<400> 387

accccaactgg ccgctgtgga gtatctccac tctccctctg tgagggccgc tcccaccgac 60
cagtcgaact ttcgtaaagt gagttaatgt gttccactc cctttttccc ctttctggcc 120
ttttggtrca gaatttctg gccttcggc atatcctggg agtctctgac ttccaggaaa 180
gccaattgct ccccgatcac ctttaagacc cggaggacct attggacctg gaaatcctcg 240
t 241

<210> 388

<211> 241

<212> DNA

<213> Homo sapiens

<400> 388

tttgtaactt tgtccacagc agagacattg agtataccat tggcatcaat gtcaaaagtg 60
acttcaatct gaggaacacc tcggggtgca ggaggtatgc ctgtgagttc aaacttgcca 120
agcaggttgt tatectttgt catggcacgc tcgccttcat aaacctgaat aagtacacca 180
ggctgggtgt cagaataggt agtgaaggtc tgtgtctgct tggtaggaat ggtggtatta 240
c 241

<210> 389

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 389

tacctntgtt agtgagcacc ttgtcttntg tgcttatntc ttnaagataa atacatggaa 60
ggatgtgaaa atcggaacac caactatgtg tctcactgca tctaagttaa gcagccacag 120
ctgtgagagt tttcaaagca gaaagatgct gatgtgacct ctggaattca gacatactga 180
gctatgggtc agaagtgtt tacttaaaaa gcaaacaatc cccaggaaat actgaatagg 240

115

a 241

<210> 390
<211> 241
<212> DNA
<213> Homo sapiens

<400> 390
gcaggtacat ccacatgttc ctccaaatga cgtttgggggt cctgcttgcc aacattcttt 60
attgccagct gttcaggtgt catcttatct tcttcttcta cagccttatt gtaattcttg 120
gctaattcca acatctcttt taccactgat tcattgcgtt tacaatgttc actgtagtcc 180
tgaagtgtca aaccttccat ccaactcttc ttatgcaaat ttagcaacat cttctgttcc 240
a 241

<210> 391
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 391
cnggcacaan cttntgtttt tnnntttttt tttttttttn tctttatttn tttttantnt 60
taaaanaaaaa nnntannnaa annnggggtt aaatnctntn nncagancat taaaactgaa 120
ggggaaaaaaa aaaccaaaaa cgagcttntt anttnacntg ggnttgggnn gntgctgatn 180
tnaagaagca anntttanan cnngcnnnat ganngagnn tcannttgaa atttnnacc 240
t 241

<210> 392
<211> 241
<212> DNA
<213> Homo sapiens

<400> 392
gaggtactaa atggtatcct tagattaaaa ttttgtgctt gataacagct gttttttcta 60
cattagaaat aagatgccac acaaggaact acattccaga tttaaagaaa tgaaaggata 120
ccattagtgt gtataacaga ttattgttca tacttgtaaa gcattctatg tcattgagaa 180
tataaagaac agtgccttag aagacagtga aaggtaagct ctagcttaat gtctatgatt 240
t 241

<210> 393
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 393
ggcaggtaca taagcataat cagttatgga cagcttcttg tataaattgc tattcancaa 60

116

```

tacataaact gcctnaaaga tttatgctta caggtagaca ttcaatttac caataaaaca 120
gcatgttctg aaaatatggg cacattttta aacatattaa gacagttctg ttaaccataa 180
tagtcccaca gtatgactga gtaataagaa tctacttcaa aagnaaaaaa aaaattaatc 240
a                                                                 241

```

```

<210> 394
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<400> 394
aggtagacga gcagtagatg gctgcaacaa ccttcctcct accccagccc agaaaatatt 60
tctgccccac cccaggatcc gggacccaaa taaagagcaa gcaggccccc ttcactgagg 120
tgctgggtag ggctcagtg cacattactg tgctttgaga aagaggaagg ggatttggtt 180
ggcactttta aaatagagga gtaagcagga ctggagaggc cagagaagat accaaaattg 240
g                                                                 241

```

```

<210> 395
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 395
nggcnggnnc caanatatga aatntnanta tnatacatga tnaaaagctt tatntatttt 60
agttagtaat taagtttaca ctgtgaataa ggattaattc ccagatgacc atctacagtt 120
actaccacat agaggggtata cacggatgga tcgattacaa gaatataaaa cttatttttc 180
ttcctgtatc cacatttctt tgcaatgtga atttgcaggc cctctcaaga agtggagtct 240
a                                                                 241

```

```

<210> 396
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 396
gaggtagacc ttgaatgaca atgctnggag cccccctgtg gtcacgacg cctccactgc 60
cattgatgca ccateccaacc tgcgtttcct ggccaccaca cccaattcct tgctgggtatc 120
atggcagccg ccacgtgccg ggattaccgg ctacatcatc aagtatgaga agcctgggtc 180
tcctcccaga gaagtgggtc ctcggtgggtc acagaggcta ctattactgg 240
c                                                                 241

```

```

<210> 397
<211> 241
<212> DNA
<213> Homo sapiens

```


117

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 397
 ggcaggtacc agcaggggga tgtgtttctg gggaattgtg gctctggaag cttcacggtt 60
 tcccagaatg tggaaaatat atctgtgcan gatagaaatc ctgcccagag gctgtttctg 120
 tctcatttga gctctccttc atgtggcaga gctgactgtg gcggtttagg agcctacatt 180
 ttagaaaagc ttacctcaaa gttctgcatt gagcctgagc actggaaagg agataaaata 240
 a 241

<210> 398
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 398
 gangtgacca ngacatcacc tnacacntgg aaagcganga nttgaatggt gcntacaang 60
 ccntaccnt tgcccannac ctgaacgcgc ctnttgattg ggacagccgt gggaaggaca 120
 gttatgaaac nantcanctg gatgaccana gtgntgaaac cnacanncac angcnntcna 180
 cattatataa ncggaaagct aatgatgaga gcaatgatca ttccgatgtt attgatagtc 240
 a 241

<210> 399
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(241)
 <223> n = A,T,C or G

<400> 399
 cagagtgaga tgggagtggg agggccaatc tgatacagaa gggggtgaag ggtagggccc 60
 ctgagcagcc cacccttac cctgacgaag gcaatcctcc tctggaatgt ctcttccctc 120
 ttcagtctgg gttctgcctc agccacgaac tgggaaggag tgaggaacat cccaacggca 180
 atgagagtat ccagtgact ccaaacagga angaatcagt gttcanaaag tcagggccct 240
 t 241

<210> 400
 <211> 241
 <212> DNA
 <213> Homo sapiens

<400> 400
 ggtactcttg ctcttttagc tagagtgtat gtgaaaataa agaaatacat cattgtattc 60
 acaaccatgt gtcttcattt ataacttttt gtttaaaaaa tttttagttc aagtttagtt 120

cattgatatt atcctctgaa tgcagttaag gctgggcaga aattctactc atgtgacatc 180
tgccacaggt ctattttgaa gcttttcttc taatgggcaa tgtttgctct taccaggatt 240
t 241

<210> 401

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 401

nncaggtact ttgtagagca gagagaggct ttggttcttc ctttcttcaa tcacgtggag 60
atgtgtcatc acctgggatt tcactctgggc cgctttttct gggccaacag ccaacacatg 120
ctggtaatga cggatgggat gtaagcgatc ttgtttctca gcacggacat aacgccgtaa 180
ggcctggaga atgcgatgag gccgtggcgg gtcagactgc aaggcagcca ggtagttctc 240
c 241

<210> 402

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 402

ggcaggtcca aaaaaaacct aaaaanngtt tcaggaatgt agagaaatat ccaacttaaa 60
tagcgaaaaa gtgcaccata attactgctg cactgcagtc atttctgcaa ttcccatggt 120
tcttaaataa ctatcttgct agataacaca caatataaag agcaattatg aaaaacagac 180
atttacatat acttctaaag tcttattggg aatatcctgt ttggccattg ggataaccaa 240
t 241

<210> 403

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 403

agggtgttaac tacccgctcc gagacgggat tgatgacgag tcctatgang ccattttcaa 60
gccggtcatg tccaaagtaa tggagatggt ccagcctagt gcggtggtct tacagtgtgg 120
ctcagactcc ctatctgggg atcgggttagg ttgcttcaat ctaactatca aaggacacgc 180
caagtgtgtg gaatttgta agagctttta cctgcctatg ctgatgctgg gaggcggtgg 240
t 241

<210> 404
<211> 241
<212> DNA
<213> Homo sapiens

<400> 404
cagggtactgc aaccataaaa atactgtttc ctcataatttc accttcctta atttggagtt 60
ttctgtcttc ttttcacggc attcaaagta ggaataaact ttgcttgtgt tgggtggata 120
ttgtttatag tgagtaacct tgtaggagtc ggtggccagg aggatgttga actcggcttc 180
tgccgcagga ttcattctcg gccggaggac aaggggcccg cgcgccgcga gtcacctgac 240
c 241

<210> 405
<211> 266
<212> DNA
<213> Homo sapiens

<400> 405
ttctgggctg gggagtggag agaaagaagt tgcagggctt acaggaaatc ccagagcctg 60
agggtttctc ccagatttga gaactctaga ttctgcatca ttatctttga gtctatatc 120
tcttgggctg taagaagatg aggaatgtaa taggtctgcc ccaagcctt catgccttct 180
gtaccaagct tgtttccttg tgcattcctc ccaggctctg gctgcccctt attggagaat 240
gtgatttcca agacaatcaa tccaca 266

<210> 406
<211> 231
<212> DNA
<213> Homo sapiens

<400> 406
ttggtgaaga accattcctc ggcatccttg cggttcttct ctgccatctt ctcatactgg 60
tcacgcatct cggttcagaat gcggtcagg tccacgccag gtgcagcgtc catctccaca 120
ttgacatctc caccacctg gcctctcagg gcattcatct cctcctcgtg gttcttcttc 180
aggtaggcca gctcctcctt caggctctca atctgcatct ccaggtcagc t 231

<210> 407
<211> 266
<212> DNA
<213> Homo sapiens

<400> 407
cagcatcatt gtttataatc agaaactctg gtccttctgt ctggtggcac ttagagtctt 60
ttgtgccata atgcagcagt atggagggag gattttatgg agaaatgggg atagtcttca 120
tgaccacaaa taaataaagg aaaactaagc tgcattgtgg gttttgaaaa ggttattata 180
cttcttaaca attctttttt tcagggaact ttctagctgt atgactgtta cttgaccttc 240
tttgaaaagc attcccaaaa tgctct 266

<210> 408
<211> 261
<212> DNA
<213> Homo sapiens

<400> 408
ctgtgtcagc gagcctcggg aactgattt ccgatcaaaa gaatcatcat ctttaccttg 60
acttttcagg gaattactga actttcttct cagaagatag ggcacagcca ttgccttggc 120

120

```

ctcacttgaa gggctctgcat ttgggtcctc tggctctcttg ccaagtttcc cagccactcg 180
agggagtaat atctggaggg caaagaagag acttatgtta ttgttgaacc tccagccaca 240
gggaggagca tgggcatggg t                                     261

```

```

<210> 409
<211> 266
<212> DNA
<213> Homo sapiens

```

```

<400> 409
gctgacagta atacactgcc acatcttcag cctgcaggct gctgatgggtg agagtgaat 60
ctgtcccaga cccgctgcc ctgaatcggt cagggatccc ggattcccgg gtagatgccc 120
agtaaatgag cagtttagga ggctgtcctg gtttctgctg gtaccaagct aagtagttct 180
tattgttga gctgtctaaa acactctggc tggctcttga gttgatgggtg gccctctcgc 240
ccagagacac agccaggag tgtgga                                     266

```

```

<210> 410
<211> 181
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 410
caaaagggtnc tttttgntca aaancnattt ttattccttg atatttttct tttttttttt 60
tttgnggatg gggacttggtg aatttttcta aaggggnnnn ttnannnnngg aagaaaaccn 120
ngntccgggtt ccagccaaac cngtngctna ctttccacct tntttccacc tccctcnggt 180
t                                     181

```

```

<210> 411
<211> 261
<212> DNA
<213> Homo sapiens

```

```

<400> 411
gccccctgcag tacttggccg atgtggacac ctctgatgag gaaagcatcc gggctcacgt 60
gatggcctcc caccattcca agcggagagg ccgggcgtct tctgagagtc agggctctagg 120
tgctggagtg cgcacggagg ccgatgtaga ggaggaggcc ctgaggagga agctggagga 180
gctggccagc aacgtcagtg accaggagac ctctcccgag gaggaggaag ccaaggacga 240
aaaggcagag cccaacaggg a                                     261

```

```

<210> 412
<211> 171
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 412

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121

```

nttttntctt tacaattcag tcttcaacaa cttgagagct ttcttcatgt tgncaagcaa 60
cagagctgta tctgcaggnt cgtaagcata nagacngttt gaatatcttc cagngatatc 120
ggctctaact gncagagatg ggtcaacaaa cataatcctg gggacatact g 171

```

<210> 413

<211> 266

<212> DNA

<213> Homo sapiens

<400> 413

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ttaggaccaa agatagcatc aactgtatct gaaggaactg tagtttgctc attttatgac 60
atttttataa agtactgtaa ttctttcatt gaggggctat gtgatggaga cagactaact 120
cattttgtta ttgcatctaa aattatcttg ggtctctgtt caaatgagtt tggagaatgc 180
ttgacttggt ggtctgtgta aatgtgtata tatatatacc tgaatacagg aacatcggag 240
acctattcac tccacacac tctgct 266

```

<210> 414

<211> 266

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 414

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tttgccataa ttgagtgaag agtggcagat ggcattaact ctgctccgct tcaagctggc 60
tccatgacca ctcaaggcct cccanccctg ttcgtcaagt tgcctcaag tccaagcaat 120
ggaatccatg tggttgcaaa aaaagtgtgc tanttttaag gnccttcgta taagaatnaa 180
tganacaatt ttcctaccaa aggangaaca aaaggataaa tataatacaa aatatatgta 240
tatgggtgtt tgacaaatta tataac 266

```

<210> 415

<211> 266

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 415

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cctccatcca gtctattaat tgttgccggg aagctanagt aagtagttcg ccagttaata 60
gtttgcgcaa cgttggtgcc attgctacag gcatcggtgt gtnacgctcg tcgattggta 120
tggttctatt cagctccggt tcccaacgat caaggcgagt tacatgatcc cccatgttgt 180
gcaaaaaagc ggtagctcc ttcggtcttc cgatcggtgt canaagtaag ttggccgcag 240
tgttatcact catgggtatg gcagca 266

```

<210> 416

<211> 878

<212> DNA

<213> Homo sapiens

122

<400> 416

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cctgacgata gccatggctg taccacttaa ctatgattct attccaactg ttcagaatca 60
tatcacaaaa tgacttgtac acagtagttt acaacgactc ccaagagagg aaaaaaaaaa 120
aaaaagacgc ctcaaaattc actcaacttt tgagacagca atggcaatag gcagcagaga 180
agctatgctg caactgaggg cacatatcat tgaagatgtc acaggagttt aagagacagg 240
ctggaaaaaaa tctcatacta agcaaacagt agtatctcat accaagcaaa accaagtagt 300
atctgctcag cctgccgcta acagatctca caatcaccaa ctgtgcttta ggactgtcac 360
caaagtcaga ttcgggtgcta accaggtggc atctatgac aacgtcgccc ctcttattta 420
acaaaggggt ctgaaggagg tgttctccaa gcaacaagga gactgcttca gtacaagact 480
ttgcaccttg aattcaattg catcaagtgt ggatagcaaa ataagtatct taccattgaa 540
atatgtgttc agcctaagat tttaccacc agcagaacaa aagtgagggg gagagggatg 600
ggccagttag gggatggggg agaaaaaaaa atcacaggat taccaccaa gccttgtttt 660
aaaagggctc ccttcactat tcaggaaggg aagtggagg agaaattaac caattcctgc 720
cacagcagcc ctttttggtt gcttcacaa tagatacttt atggagtggc acagccaacc 780
ctatctgtga cctgccctgc ggataaacac agccaagcag gtttaattag atcaaagaca 840
caaagggcta ttcctcctt tcataacaac gcagacct 878

```

<210> 417

<211> 514

<212> DNA

<213> Homo sapiens

<400> 417

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ttctgacttc tagaagacta aggcctggtc gtgtttgctt gtttgccac ctttggtga 60
taccagaga acctggycac ttgctgctg atgccaccc ctgccagtca ttcctccatt 120
caccagcgg gaggtgggat gtgagacagc ccacattgga aaatccagaa aaccgggaac 180
agggtattgc ccttcacaat tctactccc agatcctctc ccctggacac aggagacca 240
cagggcagga ccctaagatc tggggaaagg aggtcctgag aaccttgagg tacccttaga 300
tccttttcta cccactttcc tatggaggat tccaagtcac cacttctctc accggcttct 360
accaggtcc aggactaagg cgttttctcc atagcctcaa cattttggga atcttcctc 420
aatcaccctt gctcctcctg ggtgcctgga agatggactg gcagagacct ctttggtgag 480
ttttgtgctt tgatgccagg aatgccgcct agtt 514

```

<210> 418

<211> 352

<212> DNA

<213> Homo sapiens

<400> 418

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ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60
ccagtagaac cagaatcaga caggtatgag ctagtcaaca gcaagtcttt gttggattcg 120
agtaggctca ggatctgctg aaggctcggag gaggtagtcc ccgcaatcaa gaggcctgtc 180
tcctgaagcc cttgggtgata ttttgccact cagccaagaa tgaggatgca tccttcagat 240
tctctatgtc ccgaacctgg aacccatcca cgccagcttg cagccaaaac tccagagcat 300
ccttcacctt ggtggaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aa 352

```

<210> 419

<211> 344

<212> DNA

<213> Homo sapiens

<400> 419

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ctggacacca taatcccttt taagtggctg gatggtcaca cctctcccat tgacaagctg 60
ggttaagtca ataggttgac taggatcaac acgacccaaa tcaataagat actgcagtct 120
attgagactc aaaggcttat actggcgtct gaaactatgt ccttcgttaa acccgatttt 180

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123

tgggattcgg atgtaaaatg gagtctggcc tccctcaaag cccaagcggg gccgggttcc 240
tctttgcctt tctcctttat ggcctctgcc acattttcta cctcttctcc gacctcttgg 300
tcttctctcc ggtttcttgg agccgggatt cggctttaag ttgg 344

<210> 420

<211> 935

<212> DNA

<213> Homo sapiens

<400> 420

cgaaagtcaa cgtaagggg ctcagggtgaa ccatgatgat gaccttctgt tgactttgaa 60
atattggctc ttgtgggtga caaaagccag acaagctgtg gctgtgggtcc gattttaaga 120
cgaggttctc aaagatccaa aggagggaaa gggatttggg aacactgtgt atcatctgag 180
acacacgtgt cctcatgatc ttaaattgcct actttaaaagc cacctaatac tgcccttcat 240
tgtgggtcaga agagatttct acaaaagcac tcagaattct ggaggcagtt gtgattttgc 300
catgtggcag ttgggtttgtg gagttgggca ggtgtgaaag ggtaaaactc cacttctgaa 360
tgctgcttct gccccctggg acccagcaca ttgttagacc atcttcttga ctgaaaattc 420
tctcctgatg ctgagccctg caccaccacc ttcttttcc taactatgaa ttgatggcaa 480
agtccactca aaacaaccag ttaagtgtc acgagagagt agtcaagcac ctccagaaag 540
aaaccgggtt tttgttcaca tagcaggaag tgactccctg ggtggtaatt tatcttgga 600
acacaggtag attggcagaa aaacgggaac atgtaggtag cgcgatgttg gtgcatgtcc 660
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tggaattctt gagtgaattg cgcttgtctt atgggtgtgg caagggacgt tcagaactac 780
ggaaaacttt tactgaaaca gcgaagcaga gtataccggc atgagagggg agatgaacac 840
tcacctatgt accactcttt gacaataaat atagtatttc tcaaaaaaaaa aaaaaaaaaa 900
agtaaaaaaa ctgaaatcgc aagtcaaaaa atcca 935

<210> 421

<211> 745

<212> DNA

<213> Homo sapiens

<400> 421

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tgaagctctg tttgagctcc tgggatatgt gagctgtttc tatgcataat ggatattcgg 120
ggttaacaac agtcccctgc ttggcttcta ttctgaatcc ttttctttca ccatggggtg 180
cctgaagggt ggctgatgca tatgggtacaa tggcaccag tgtaaagcag ctacaattag 240
gagtggatgt gttctgtagc atcctattta aataagccta ttttctctt tggcccgta 300
actctgttat ctgctgcttg tactgggtgcc tgtacttttc tgactctcat tgaccatatt 360
ccacgaccat ggttgtcatc cttacttga tctacttta catgtctagt ctgtgtgggt 420
gggtggatgaat aggtctcttt ttacatgggtg ctgccagccc agctaattaa tgggtgcacgt 480
ggacttttag caagcgggct cactggaaga gactgaacct ggcatggaat tcctgaagat 540
gtttgggggt tttttctttc ttaatcgaaa gttaacattg tctgaaaagt tttgttagaa 600
ctactgcgga acctcaaaat cagttagattt ggaagtgatt caaagctaaa ctttttctt 660
ggccctcctt gtgttctaatt tgcttgcaag tgtaatacta ggatgtccaa gatgccagtt 720
tttgcttctt tgtagttgt cagac 745

<210> 422

<211> 764

<212> DNA

<213> Homo sapiens

<400> 422

gagttcagta gcaaagtcac acctgtccaa ttccctgagc tttgtcact cagctaattg 60
gatggcaaaag gtgggtgggtgc tttcatcttc aggcagaagc ctctgcccac cccctcaag 120

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ggctgcaggc ccagttctca tgcctgccctt ggggtgggcat ctgttaacag aggagaacgt 180
ctgggtggcg gcagcagctt tgctctgagt gcctacaaag ctaatgcttg gtgctagaaa 240
catcatcatt attaaacttc agaaaagcag cagccatgtt cagtcaggct catgctgect 300
cactgcttaa gtgcctgcag gagccgcctg ccaagctccc ctctctacac ctggcacact 360
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tttgaggcca agaaacactc tgtgtgactc tacacacact tcagggtggtt tgtgcttcaa 480
agtcattgat gcaacttgaa aggaaacagt ttaatgggtg aaatgaacta ccatttataa 540
cttctgtttt ttatttgaga aaatgattca cgaattccaa atcagattgc caggaagaaa 600
taggacgtga cggtagctgg cctctgtgatt ctcccagccc ttgcagtcctg ctagggtgaga 660
ggaaaagctc ttacttccg cccctggcag ggacttctgg gttatgggag aaaccagaga 720
tggaatgag gaaaatatga actacagcag aagcccctgg gcag 764

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<210> 423

<211> 1041

<212> DNA

<213> Homo sapiens

<400> 423

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ctcagagagg ttgaaagatt tgcctacgaa agggacagtg atgaagctaa gctctagatc 60
caggatgtct gacttcaaatt tgaaactccc aaagtaatga gtttggaagg gtggggtgtg 120
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180
tggttggcg tggtgctttc ccaaaggttt ttttttagg tccgtcgctg tcttgtggat 240
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agctcagggc cacagtgcga tgaggacctt cttctcacct ctctaaatgc aggaagaaac 360
gcagagtaac gtggaagtgg tccacaccta ccgccagcac atgtggaatg acatgaacct 420
cggcaacctg cacctgttca tcaatgccta caacaggat tgggatgtag ttcagccaca 480
tcattgctat ttatgagggtg tcttctgtag atccgaaatg tgggacagat gagagggaga 540
gtataaaatg agcgaagag gcaggctctg agtttgagca aatagattaa taggacaggt 600
gtccccagga aggacacctg gcctgtaagc tggttccctg cattcagctc gccttgagg 660
gatctgaaca aacactccag accactgggg gtgcagacgt gagagggacg cagtcgcaca 720
ctcagagggg tgagagtaaa tatgtgtgcc cgctgctgac cttcacgaaa ggccaaatgt 780
aagaagagct aagtgaagag gcagcaaagc actcctggag gccgggggata atccaggcag 840
gcttctggga gtttgtcatt ccaaggataa ggaggacctg aacatggcct ttgcctaagg 900
cgtggccctc tcaaccagca ctagggtgct atctggagct cagctagggg aggagacagc 960
tcagggccat tggtgtcagc cagagactct gtaatcttcc agggagctcg ctcaacctgc 1020
tgagctcgct ctgccacgca c 1041

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<210> 424

<211> 1288

<212> DNA

<213> Homo sapiens

<400> 424

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ctaagaactg agacttgtga cacaaggcca acgacctag attagcccag ggttgtagct 60
ggaagacctt caaccgaagg atggaaggcc cctgtcacia agcctacctt gatggataga 120
ggacccaagc gaaaaaggta tctcaagact aacggccgga atctggaggc ccatgaccca 180
gaacccagga aggatagaag cttgaagacc tggggaaatc ccaagatgag aaccctaaac 240
cctacctctt ttctattgtt tacacttctt actcttagat atttccagtt ctctgttta 300
tctttaagcc tgattctttt gagatgtact ttttgatgtt gccggttacc tttagattga 360
cagtattatg cctgggcccag tcttgagcca gctttaaate acagctttta cctatttgtt 420
aggctatagt gttttgtaaa cttctgtttc tattcacatc ttctccactt gagagagaca 480
ccaaaatcca gtcagtatct aatctggctt ttgttaactt ccctcaggag cagacattca 540
tatagggtgat actgtatttc agtcttttct tttgacccca gaagccctag actgagaaga 600
taaaatggc aggttgttgg ggaaaaaaa gtgccaggct ctctagagaa aaatgtgaag 660
agatgctcca ggccaatgag aagaattaga caagaaatac acagatgtgc cagacttctg 720

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agaagcacct gccagcaaca gcttccttct ttgagcttag tccatccctc atgaaaaatg 780
actgaccact gctgggcagc aggagggatg atgaccaact aattcccaaa cccagtcctc 840
attggtacca gccttgggga accacctaca cttgagccac aattggtttt gaagtgcatt 900
tacaagtttc tggcatcact accactactg attaaacaag aataagagaa cattttatca 960
tcctctgctt tattcacata aatgaagttg tgatgaataa atctgctttt atgcagacac 1020
aaggaattaa gtggcttcgt cattgtcctt ctacctcaaa gataatttat tccaaaagct 1080
aagataaatg gaagactcct gaacttgtga actgatgtga aatgcagaat ctcttttgag 1140
tctttgctgt ttggaagatt gaaaaatatt gttcagcatg ggtgaccacc agaaagtaat 1200
cttaagccat ctagatgtca caattgaaac aaactgggga gttggttgct attgtaaaat 1260
aaaatatact gttttgaaaa aaaaaaac 1288

<210> 425

<211> 446

<212> DNA

<213> Homo sapiens

<400> 425

ccacttaaa ggtgcctctg ccaactgggtg gaatcatcgc cacttccagc accacgccaa 60
gcctaacatc ttccacaagg atccccgatgt gaacatgctg cacgtgtttg ttctgggcga 120
atggcagccc atcgagtacg gcaagaagaa gctgaaatac ctgccctaca atcaccagca 180
cgaatacttc ttcttgattg ggccgccgct gctcatcccc atgtatttcc agtaccagat 240
catcatgacc atgatcgctc ataagaactg ggtggacctg gcctgggccc tcagctacta 300
catccggttc ttcatcacct acatcccttt ctacggcatc ctgggagccc tccttttctt 360
caacttcatc aggttccttg agagccactg gtttgtgtgg gtcacacaga tgaatcacat 420
cgtcatggag attgaccagg aggacc 446

<210> 426

<211> 874

<212> DNA

<213> Homo sapiens

<400> 426

tttttttttt tttttttttt ttttttcaat taaagatttg atttattcaa gtatgtgaaa 60
acattctaca atggaaactt ttattaaatg ctgcatgtac tgtgctatgg accacgcaca 120
tacagccatg ctgtttcaga agacttgaaa tgccattgat agtttaaaaa ctctacaccc 180
gatggagaat cgaggaagac aatttaatgt ttcacttgaa tccagagggtg catcaaatta 240
aatgacagct ccacttgga aataatagct gttacttgat ggtatccaag aagaaatggt 300
tggtgatgga taaattcaga aatgcttccc caaagggtggg tggtttttaa aaagttttca 360
ggtcacaacc cttgcagaaa aactgatgc ccaacacact gattcgcggt ccaggaaaca 420
cgggtcttcc aagtccaag gggctggggt tccccaacga tcaagttcct gtgctgtaat 480
caagagggtc ctttgactg gatagggagc acttgggagc tgtacaccat cagtcataat 540
ggatggcagt gtaaaagatg atccaaatga cctgagatgc tcctgaggag tgggtgcacca 600
gacccaggag tgccactgta gggctgcttc tttgcttttag tcatcacaca cacacacagc 660
tccagagcag caatggcctt tcctgtaaca ggaaaaaagc ctctgctat tcccaagaac 720
cctcgtaatg gcaaaactcc ccaaatagaca cccaggacca cagcaatgat ctgtcggaac 780
cagtagatca catctaaaaa ttcatcctta tcctcccagg ccgcgtcgct ccgcagcacc 840
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<210> 427

<211> 638

<212> DNA

<213> Homo sapiens

<400> 427

126

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acttgaatt agcacttggg gaaagctgga aggaagataa ataacactaa actatgctat 60
ttgatttttc ttcttgaaag agtaagggtt acctgttaca ttttcaagtt aattcatgta 120
aaaaatgata gtgattttga tgaattttat ctcttggttg aatctgtcat tcaaaggcca 180
ataatttaag ttgctatcag ctgatattag tagctttgca accctgatag agtaaataaa 240
ttttatgggc gggtgccaaa tactgctgtg aatctatttg tatagtatcc atgaatgaat 300
ttatggaaat agatatttgt gcagctcaat ttatgcagag attaaatgac atcataatc 360
tggatgaaaa cttgcataga attctgatta aatagtgggt ctgtttcaca tgtgcagttt 420
gaagtattta aataaccact cctttcacag tttattttct tctcaagcgt tttcaagatc 480
tagcatgtgg attttaaaaag atttgccctc attaacaaga ataacattta aaggagattg 540
tttcaaaata tttttgcaaa ttgagataag gacagaaaga ttgagaaaca ttgtatattt 600
tgcaaaaaca agatgtttgt agctgtttca gagagagt 638

```

<210> 428

<211> 535

<212> DNA

<213> Homo sapiens

<400> 428

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acaagatgat tcttcttctt caatttgaca gatcaaagaa gtatcccttg ctaattcaag 60
tgtatgggtg tccctgcagt cagagtgtaa ggtctgtatt tgctgttaat tggatatctt 120
atcttgcaag taaggaaggg atggtcattg ccttggtgga tggctgagga acagctttcc 180
aagggtgacaa actcctctat gcagtgtatc gaaagctggg tgtttatgaa gttgaagacc 240
agattacagc tgtcagaaaa ttcatagaaa tgggtttcat tgatgaaaaa agaatagcc 300
tatggggctg gtcctatgga ggatacgttt catcactggc ccttgcctct ggaactggct 360
ttttcaaatg tggatatagca gtggctccag tctccagctg gyaatattac gcgtctgtct 420
acacagagag attcatgggt ctccaacaa aggatgataa tcttgagcac tataagaatt 480
caactgtgat ggcaagagca gaatatttca gaaatgtaga ctatcttctc atcca 535

```

<210> 429

<211> 675

<212> DNA

<213> Homo sapiens

<400> 429

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actattttca accctgagca ttaacactgc ataccaaggg ggggtgggtc aagaagctgg 60
ttagatcgaa gcacagcac aagccactga tattctctat gtgatcagg ttttacaaaa 120
aaatacatag ttttcaataa ataatgctta attttacaac tttgatacag caatgtcata 180
caccgtttca acacactaca ctctgcatgc tagatagtct acgagaagac gaaactttgc 240
catgcatttt ctttcccccc tagtgcctatc aaacacttca tctccagcg cactgcctca 300
ggtagcttta ctttctctct gtttcacagc aataggccgt gcgctggcat gcaaactcta 360
aaaaagggtc ccccccacaa ccactcagac ttctacacaa aagggttttt cagcttttct 420
gtccccaaac ctggagtggc taagaaagta agtttcatgt ggccttggaa aatacacact 480
tgttaacagt gtcctgctga aaactgctct aaaacatcag gtgggtctgt cctgggtggc 540
gtcacgaagc attatgggat gccataacca ctaggagtcc caaaccggaa aaaataggcc 600
tccgttttaa aacagtcaat tcaaaaaagg tgtcacagaa caaatgcaaa agactcttaa 660
accacaaca tatgt 675

```

<210> 430

<211> 434

<212> DNA

<213> Homo sapiens

<400> 430

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acctctgcc aaggtccagc gagaggacct cacagtagag cacaggccac tccgggagtg 60
catcagaaga ttcattctca tggaggaaga aggtttcaaa cgtgaatggg taggagaagt 120

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127

gagccacctt gtccattgcc agggacttgg tgggtgcaggt ctgtgttact cctgagagct 180
 gctggaatgc tgggcttgac cagtgcagcag ttggcaattc tacaaagaag tggacgtaga 240
 gattgtcata ctcatagcct tgggctgaaa cgacctctcc atttacaaag agccggaggg 300
 cacctgggac agtcatctca aagtcgggtgc ctacgagggt gctgagatac tccttgtgcc 360
 ggccataaag atccttgaac actcgcctgt cccgctcctc ctctccggc tgtgcgtggg 420
 gggaacatt gtcg 434

<210> 431

<211> 581

<212> DNA

<213> Homo sapiens

<400> 431

acacaagcct ccagcccgac ccagcggcct aatgaaactc tggcaacctc tcctgggctg 60
 ggccacgagt atccagctcc aagcccaagt gaggggggga gtcaacttcc ccatgattgc 120
 caagtgacca agaccagaag cagggacgat taggctagtt ctgcggaag gtgaactgga 180
 gacctgtct ctgcccctcc tccctggcct gtcccacaga catcccgttg tttaaccac 240
 tgcctttgca aggacctgct ctgtccactc caaatcaaaag gatacttgca tccttcttac 300
 acagactccc atctctctgc tcatagtggg cccaggtgc ccgagaaaaa gaaacttggg 360
 tcagtagaag gctcattagt gtgaaggagt gagaggccag gccttctgt gacataatgc 420
 ttctatgctt gtttcctaaa cacttgggtcc acacacaata cctgggcagg aagagagaac 480
 caagcaccac tggatggctc tggagccagg ggacttctat gcacatacaa ccaacatcac 540
 cccactctgc tcatctgtgc ctccaccctg aacagcagag t 581

<210> 432

<211> 532

<212> DNA

<213> Homo sapiens

<400> 432

actccaactc aagtttacaa gttacacctt tgccacagcc ttggctaaat cttgaactag 60
 tgcagaattc agctgtggta gagtgctgat cttagcatgc ttcgatgtgg catacttgtt 120
 cttgacagtc atgtgctttg taagtccctg atttaccatg actacattct tagccagggtg 180
 ctgcataact ggaagaagag attcctcagt atatgacagg taatgttgta gagttgggtg 240
 ccattcacca ttatccagaa ttttcagtgc taagcaaaaa gctcctgctg caatttgaga 300
 aggaggaagg tgcaccatgt catagtccaa catagttagt tccatcagggt atttggccaa 360
 agtatgttgc tgcacatcaa cctctccaat cttagatgct ctccgaagga agtgcaaagg 420
 tagaggccga cccagaccaa agtttaaagc tcttagaata ttcatttcca tctgtctgat 480
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<210> 433

<211> 531

<212> DNA

<213> Homo sapiens

<400> 433

acttggtttt acagctcctt tgaaaactct gtgtttggaa tatctctaaa aacatagaaa 60
 acactacagt ggttttagaaa ttactaattt tacttctaag tcattcataa acctgtgcta 120
 tgaaatgact tcttaaataat ttagttgata gactgctaca ggtaataggg acttagcaag 180
 ctcttttata tgctaaagga gcatctatca gattaagtta gaacatttgc tgtcagccac 240
 atattgagat gacactaggt gcaatagcag ggatagattt tgttgggtgag tagtctcatg 300
 ccttgagatc tgtgggtggc ttcaaaatgg tggccagcca gatcaaggat gtagtatctc 360
 atagttccca ggtgatattt ttcttattag aaaaatatta taactcattt gttgtttgac 420
 acttatagat tgaaatttcc taatttatcc taaattttaa gtggttcttt ggttccagtg 480
 ctttatgttg ttgttgtttt tggatgggtg tacatattat atgttctaga a 531

<210> 434
 <211> 530
 <212> DNA
 <213> Homo sapiens

<400> 434
 acaagagaaa acccctaata aaaggatggc tttagatgac aagctctacc agagagactt 60
 agaagttgca ctagctttat cagtgaagga acttccaaca gtcaccacta atgtgcagaa 120
 ctctcaagat aaaagcattg aaaaacatgg cagtagtaaa atagaaacaa tgaataagtc 180
 tcctcatatc tctaattgca gtgtagccag tgattattta gatttggata agattactgt 240
 ggaagatgat gttggtggtg ttcaaggga aagaaaagca gcattctaaag ctgcagcaca 300
 gcagaggaag attcttctgg aaggcagtga tggatgagtg gctaatagca ctgaaccaga 360
 ctttgcacct ggtgaagatt ctgaggatga ttctgatttt tgtgagagtg aggataatga 420
 cgaagacttc tctatgagaa aaagtaaaagt taaagaaatt aaaaagaaag aagtgaaggt 480
 aaaatcccca gtagaaaaga aagagaagaa atctaaatcc aaatgtaatg 530

<210> 435
 <211> 677
 <212> DNA
 <213> Homo sapiens

<400> 435
 accttatgat ctaattaata gatattagaa acagtagaaa gacaagttac acgtcaatgc 60
 ccaatgacta gagtcaacat taaagagttg taatttaagt aatccaaact gacatctaata 120
 tccaaaatca tttataaaat gtatttggct ttggaatcca caggacttca aacaagcaaa 180
 gtttctactgc agatagtcac aaagatgcag atacactgaa atacttaaga gccttattaa 240
 tgatttttgt tattttggat cttctgtttt tttcttatta tgggtccgaag cctccttaata 300
 accaattttat cagacagaag catgtcatct tgttgttcaa gataatccag taaattttca 360
 gtccattcaa gtgccgcttt atggctaata cgcttctctg gattcagttc tgtttttcta 420
 ctcttactgg aaggcttttg ctcagcagcc ttggtctggt cctcagcact ttcactgtca 480
 gtcagcacct gacagcttga gtcactgttc cgagagtcga accactgata aatatttcta 540
 atgtcaacat gttcacattc ttctgtgttc tgtaaaactg ttgctaaatt agctgctaaa 600
 atggctcctt catcaatgtt catacctgaa ttctcttcat tgccaggga aagttttttc 660
 catgcttttg ttatggt 677

<210> 436
 <211> 573
 <212> DNA
 <213> Homo sapiens

<400> 436
 acctcttagg gtgggagaaa tggatgaagag ttgttctctac aacttgctaa cctagtggac 60
 agggtagtag attagcatca tccggataga tgtgaagagg acggctgttt ggataataat 120
 taaggataaa atttggccag ttgacagatt ctgtttccag cagtttttac agcaacagtg 180
 gagtgcttca gtattgtgtt cctgtaaatt taattttgat ccgcaatcat ttggtatata 240
 atgctgtttg aagttttgtc ctattggaaa agtcttgtgt tgcaggggtg cagttaagat 300
 ctttgtgatg aggaatggga tgggctaatt ttttgccgtt ttcttggaaat tgggggcatg 360
 gcaaatacag tagggtagtt tagttcttta cacagaacat gataaactac acctgttgat 420
 gtcaccgtct gtcaatgaat attatagaag gtatgaaggt gtaattacca taataacaaa 480
 acacctgtc tttagggctg acctttcgtc ctttgacctc ctcagcctcc attcccatct 540
 tcgctcagac tgcaagtatg tttgtattaa tgt 573

<210> 437
 <211> 645

<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(645)
<223> n = A,T,C or G

<400> 437
acaattggtg tccatatctt gttgaaattg taatgggaaa acaatatatt tcaatctcta 60
tgtagatagt gggtttttgt ttccataata tattctttta gtttactgta tgagttttgc 120
aggactgcat aatagatcac cacaatcata acatcttagg accacagaca tttatgagat 180
catggcttct gtgggttaga agtatgctca tgtcttaact gggtcctctg ctcagtctta 240
tctggctgca atcaagggtg cagctgggct gaattttcat ttggaatctt gactgggaaa 300
gagtctgctt ccaagggtcat gaagtttgct ggcaaaatgt atgtttttat gacagtatga 360
ctgaaatccc aagctatctc ctgactttta gctgggtaat ctcaggccct aaatggtgcc 420
tacagttcct agaggctggg cacagttctt agccatgtgg atttcctcaa catggctgct 480
tgcttcatca agtcagcaag aatagcctgt catatcagtg tatatcaggc tcaactcagga 540
taatttccct actgatgagc caaacactaa ctgatttttag agcttaacta catctgcaaa 600
attcngttca ccagaggcaa gtcatatcca gggaaggaga agtgt 645

<210> 438
<211> 485
<212> DNA
<213> Homo sapiens

<400> 438
acagaattga gagacaagat tgcttgtaat ggagatgctt ctagctctca gataatacat 60
atctctgatg aaaatgaagg aaaagaaatg tgtgttctgc gaatgactcg agctagacgt 120
tcccaggtag aacagcagca gctcatcact gttgaaaagg ctttggcaat tctttctcag 180
cctacaccct cacttgytgt ggatcatgag cgattaaaaa atcttttgaa gactgttggt 240
aaaaaaagtc aaaactacaa catatttcag ttggaaaatt tgtatgcagt aatcagccaa 300
tgtatttate ggcacgcaa ggaccatgat aaaacatcac ttattcagaa aatggagcaa 360
gaggtagaaa acttcagttg ttccagatga tgatgtcatg gtatcgagta ttctttatat 420
tcagttccta ttttaagtc ttttgatcat tccgccta at tgatgtagta tgaaacctg 480
catct 485

<210> 439
<211> 533
<212> DNA
<213> Homo sapiens

<400> 439
acagcagttt cctcatccct gcagctgtgt ttgaacaggt catttaccat actgtcctcc 60
aggttcaaca gtatggctcc aaatgatgaa atttcattct gattttctgg ctgaagacta 120
ttctgtttgt gtatgtccac cacagttact ttatcccttc atctgtggat gggcagaatg 180
aaacatatat ggaaatgttc tgtgcaataa aaacagcagt ggtaacacag atgtaggctc 240
tgagtgtctc actggagact gaagtccaca gatatgcaac aaagcctttg tctccctgat 300
gtttttgcct cctgctggtc atgtgctttc acacatcaag agaggacatt taacatttga 360
gccacagtgt catttgctgt tgtctgatgg ttggttggca gagaatttga actggagatg 420
aactttatta tccaggacgc tgagagtata acatgcatga cagagctttt agagcactgt 480
gatgtaacat gtcaagcaga aatagggagc atgtttacag ccattctatg aaa 533

<210> 440
<211> 341

<212> DNA

<213> Homo sapiens

<400> 440

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catggggtag ggggggtcggg gattcattga attgtggttg gcaggagcaa gccctgctca 60
cactctcaca ctgcgaccca gaattgtcaa agatacagat tgtaaaaatc tacgatccct 120
cagtctcact cacaaaaaat aaaatctcat gtccccaacg aaccagagt cagacgacag 180
ctggagcatt ggcagggaca gtcagaaagg agacaagtga aaacggtcag atggacacag 240
gcggaggaga aaagacagag ggagagagac catcggggaac aatcagaggg gccgagacga 300
tcagaaaagg gtcagcccga gacaggctga gccagagttt c 341
```

<210> 441

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(572)

<223> n = A,T,C or G

<400> 441

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aagtttgggg ataatttatt atgcagcaag agataatata caggacttct canagcactt 60
aatatgttaa tataaatctc caanaaaaaa gatatacaat gaaacattcc tcttagttat 120
ctggccaagg anactttntt tttttganaa tattcttcaa aaagctgac taatgatatg 180
gctctgggtcc tacaattcca tgtaacttct aaccttgatt ttatctcat agcaaatcat 240
ttatccttcc agaacctcaa cttttccctt ttacaaagta gaaataaacc atctgccttt 300
acataaatca ttaatacagc cctggatggg cagattctga gctatttttg gctggggggg 360
gggaaatagc ctgtggaggt cctaaaaaga tctacggggc tcgagatggg tctctgcaag 420
gtagcaggtg ggctcagggc ccatttcagt ctttgttccc caggccattt ccacaaaatg 480
gtgagaaaata gtgtcttctt ttagcttgct cataactcaa agatgggggg catggacctg 540
ggcctttcta ggctagggca tgaacctcct cc 572
```

<210> 442

<211> 379

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(379)

<223> n = A,T,C or G

<400> 442

```
tcccagctgc actgcttaca cgtcttccct cgtnttcacc taccceagagg ctgactcctt 60
ccccagntgt gcagctgccc accgcaaggg cagcagcagc aatgagcctt cctctgactc 120
gctcagctca cccacgtgc tggccctgtg agggggcagg gaaggggagg cagccggcac 180
ccacaagtgc cactgcccga gctggtgcat tacagagagg agaaacacat cttccctaga 240
gggttccctgt agacctaggg aggaccttat ctgtgcgtga aacacaccag gctgtgggcc 300
tcaaggactt gaaagcatcc atgtgtggac tcaagtcctt acctcttccg gagatgtagc 360
aaaacgcata gagtgtgta 379
```

<210> 443

<211> 511

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 443

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acatgcccc aaaggctcgc ttcattgcta cgattctcta cttaaatacca cattcacagc 60
tattgcctca gacctctgg aggaggggcc aggggttagc tggctttgaa tagcatgtag 120
agcacaggca gtgtggccac aaatgtcaca caggtagacca gggtagctata gatgggtgttc 180
ctgttgactt gggcttctag tctctgctcc gtgtctgaca gtgccaagat catgctcccc 240
tgctccagca agaagctggg catagccccg tctgctgggt ccaccaggcc tgggtgtgct 300
gcagacttta caagctgaac caccacagcc atttggttac aagtcttttc taggccatca 360
agctgctctc gtaagccttc tagacatgaa tggacttgcc tggaatgact aagctgctct 420
ttcaaggcag ctgaaaggac atcnacatct ctgtctctgg tcgggggact acctgcctgt 480
gaccagagt cctgccctgg cccagcagca t 511
```

<210> 444

<211> 612

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(612)

<223> n = A,T,C or G

<400> 444

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acaggaagaa ttctacagtt aatctatcac agtgttccag caaagcatat gttgaaaact 60
acagttttca atctaaccatc taaattttta aaagtagcat ttcagcaaca aacaagctca 120
gagaggctca tggcaaaagt gaaataacag aactattgct cagatgtctg caaagtcaag 180
ctgctgccct cagctccgcc cacttgaagg cttaggcaga cacgtaaggt ggcgggtggct 240
ccttggcagc accattcaca gtggcatcat catacggagg tagcagcacc gtagtgtcat 300
tgctggtaac ataaaccagg acatcagagg agttcctacc attgatgtat cggtagcagt 360
tccaaacaca gctaatacag taacccttaa aagtcaagat aatgctaata aacagaagaa 420
taataaggac caaacaggta ggattcactg acatgacatc atctctgtag ggaaaattag 480
gaggcagttg ccgtatgtat tcctgaatgg agtttggata aataagcaca gtgattgcaa 540
ccaacanctt cagggcacaag tcaaagatct ggtaacagaa gaatgggatg atccaggctg 600
cgcgttgctt gt 612
```

<210> 445

<211> 708

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(708)

<223> n = A,T,C or G

<400> 445

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accatcctgt tccaacagag ccattgccta ttcctaaatt gaatctgact ggggtgtgccc 60
ctcctcggaa cacaacagta gaccttaata gtggaaacat cgatgtgcct cccaacatga 120
caagctgggc cagctttcat aatgggtgtgg ctgctggcct gaagatagct cctgcctccc 180
```

132

```

agatcgactc agcttggatt gtttacaata agcccaagca tgctgagttg gccaatgagt 240
atgctggctt tctcatggct ctgggtttga atgggcacct taccaagctg gcgactctca 300
atatccatga ctacttgacc aaggggccatg aaatgacaag cattggactg ctacttgggtg 360
tttctgctgc aaaactaggc accatggata tgtctattac tcggcttggt agcattcgca 420
ttcctgctct cttaccccca acgtccacag agttggatgt tcctcacaat gtccaagtgg 480
ctgcagtggc tggcattggc cttgtatc aagggacagc tcacagacat actgcagaag 540
tcctgttggc tgagatagga cggcctcctg gtccctgaaat ggaatactgc actgacagag 600
agtcatactc cttagctgct ggcttggccc tgggcattgg ctncctgggg catggcagca 660
atttgatagg tatgtntgat ctcaatgtgc ctgagcagct ctatcagt 708

```

<210> 446

<211> 612

<212> DNA

<213> Homo sapiens

<400> 446

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acaagcaacg cgcagcctgg atcatcccat tcttctgtta ccagatcttt gactttgccc 60
tgaacatggt gggtgcaatc actgtgctta tttatccaaa ctccattcag gaatacatatc 120
ggcaactgcc tcctaatttt cctacagag atgatgtcat gtcagtgaat cctacctgtt 180
tggtccttat tattcttctg tttattagca ttatcttgac ttttaagggt tacttgatta 240
gctgtgtttg gaactgctac cgatacatca atggtaggaa ctctctgat gtcctggttt 300
atgttaccag caatgacact acggtgctgc taccctcgta tgatgatgcc actgtgaatg 360
gtgctgccaa ggagccaccg ccaccttacg tgtctgccta agccttcaag tgggaggagc 420
tgagggcagc agcttgactt tgcagacatc tgagcaatag ttctgttat tcaactttgc 480
catgagcctc tctgagcttg tttgttgcg aaatgctact ttttaaaatt tagatgttag 540
attgaaaact gtagttttca acatatgctt tgctggaaca ctgtgataga ttaactgtag 600
aattcttctt gt 612

```

<210> 447

<211> 642

<212> DNA

<213> Homo sapiens

<400> 447

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actgaaagaa ttaaagtcag aagtcttccc aaaacaaaaa gaactgcccc cagagaaaat 60
cctttctgat acttttcatt gctaaaataa aacaggcggg aaatgtggaa aagaaattca 120
acaaaataat gtagcaccag aagaacaagt cctagatgat tcaagttcaa aaggtaagct 180
ccagcaatgt ggaagaggta aagaccaatg tagacaagct gacgaggaat atcttctttt 240
ttggttttct ggaagtagag ttcaggaaaa gcatgaagcc agtaagccag ctgtgatatg 300
tagaaaaact tcatttgaaa tgtcatcagg ttatggggat aagccctcca taagatagtt 360
gggtctgaga ttagtatttc agagatgaga atgaatgtgc cccaaacaca ggcaaaaagg 420
tagaacgcac taagctgacc agattcatta aacttgctgt gttttgtttt ggagaagtgc 480
attcgctgtg taattttatc caacatatac tcttgaatta cggcatgaat aattatcgcc 540
actagcatgt agaagaaaac agtagccaaa tctttgatgc catagtaata aaggggacact 600
gattcagtag cttgttcttc tgttgctggg aggggtgacat tg 642

```

<210> 448

<211> 394

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(394)

<223> n = A,T,C or G

<400> 448
accagaagac cttagaaaaa ggaggaaaagg aggagaggca gataatttgg atgaattcct 60
caaagngttt gaaaatccag aggttcctag agaggaccag caacagcagc atcagcagcg 120
tgatgttatc gatgagccca ttattgaaga gccaaagccgc ctccaggagt cagtgatgga 180
ggccagcaga acaaacatag atgagtcagc tatgcctcca ccaccacctc agggagttaa 240
gcgaaaagct ggacaaattg acccagagcc tgtgatgcct cctcagcagg tagagcagat 300
ggaaatacca cctgtagagc ttccccaga agaacctcca aatatctgtc agctaatacc 360
agagttagaa cttctgccag aaaaagagaa ggag 394

<210> 449

<211> 494

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(494)

<223> n = A,T,C or G

<400> 449
acaaaaaaca caaggaatac aaccaatag aaaatagtc tgggaatgtg gtcagaagca 60
aaggcntgag tgtctttctc aaccgtgcaa aagccgtgtt ctccccggga aaccaggaaa 120
aggatccgct actcaaaaac caagaattta aaggagtctt ttaaatttcg accttgtttc 180
tgaagctcac ttttcagtgc cattgatgtg agatgtgctg gagtggctat taaccttttt 240
ttcctaaaga ttattgttaa atagatatgt tggtttgggg aagtgaatt ttttataggt 300
taaatgtcat tttagagatg gggagaggga ttatactgca ggcagcttca gccatgttgt 360
gaaactgata aaagcaactt agcaaggctt cttttcatta ttttttatgt ttcacttata 420
aagtcttagg taactagtag gatagaaaca ctgtgtcccg agagtaagga gagaagctac 480
tattgattag agcc 494

<210> 450

<211> 547

<212> DNA

<213> Homo sapiens

<400> 450
actttgggct ccagacttca ctgtccttag gcattgaaac catcacctgg tttgcattct 60
tcatgactga ggttaactta aaacaaaaat ggtaggaaag ctttcctatg cttcgggtaa 120
gagacaaatt tgcttttgta gaattgggtg ctgagaaagg cagacagggc ctgattaaag 180
aagacatttg tcaccactag ccaccaagtt aagttgtgga acccaaaggt gacggccatg 240
gaaacgtaga tcatcagctc tgctaagtag ttagggggaag aaacatatc aaaccagtct 300
ccaaatggga tcctgtggtt acagtgaatg gccactcctg ctttattttt cctgagattg 360
ccgagaataa catggcactt atactgatgg gcagatgacc agatgaacat catcatccca 420
agaatatgga accaccgtgc ttgcatcaat agatttttcc ctgttatgta ggcattcctg 480
ccatccattg gcacttggct cagcacagtt aggccaaaca ggacataata gacaagtcca 540
aaacagt 547

<210> 451

<211> 384

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

134

<222> (1)...(384)

<223> n = A,T,C or G

<400> 451

```

actacttntt gggttaaaang ccactggtag agtcactctga ntgtaaacaa tgtccctgca 60
ctgctggaaa aatccactgg ctcccaagaa aagaaaatgg tctgaagcct ctgttggtggc 120
tctcacaact catctttccc taagtcacat agctccacat cactgaggtc aatgtcatcc 180
tccacgggaa gctcgccatc cctgccgtcc caaggctctc tctcaacgat ggtagggaaa 240
gccccgcttc ctacaggtgc cgtggagcca cgcccaaaag agagctccct gagaaactcg 300
ttgatgcctt gctcactgaa ggagcctttt agcagagcaa atttcatctt gcgtgcattg 360
atggcggcca tggcggggtg ccca

```

384

<210> 452

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 452

```

actctaaagt tgccactctc acaggggtca gtgataccca ctgaacctgg caggaacagt 60
cctgcagcca gaatctgcaa gcagcgcttg tatgcaacgt ttagggccaa aggetgtctg 120
gtgggggttg tcatcacagc ataatggcct agtaggtcaa ygatccaggg tgtgaggggc 180
tcaaagccag gaaaacgaat cctcaagtcc ttcagtagtc tgatgagaac ttttaactgtg 240
gactgagaag cattttcctc gaaccagcgg gcatgtcgga tggctgctaa ngcactctgc 300
aatactttga tatccaaatg gagttctgga tccagttttc naagattggg tggcactgtt 360
gtaatganaa tcttctactgt a

```

381

<210> 453

<211> 455

<212> DNA

<213> Homo sapiens

<400> 453

```

actgtgctaa acagcctata gccaaagtttt aaagagttac aggaacaact gctacacatt 60
caaagaacag gcattcactg cagcctcctg atttgacctg atgggagggg caggagaatg 120
agtcactctg ccaccacttt tcttgccctg gatttgtaga ggatttggtt tgctctaatt 180
tgtttttcct atatctgccc tactaaggta cacagtctgg gcactttgaa aatgttaaag 240
tttttaacgt ttgactgaca gaagcagcac ttaaaggctt catgaatcta ttttccaaaa 300
aaagtatgct ttcagtaaaa cattttacca ttttatctaa ctatgcactg acatttttgt 360
tcttcttgaa aaggggattt atgctaacac tgtattttta atgtaaaaat atacgtgtag 420
agatatttta acttcctgag tgacttatac ctcaa

```

455

<210> 454

<211> 383

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 454

```
acagagcanc ttacaaagtt gtcacatttc ttataaaatt tttttaaagc tacagtttaa 60
tacaaaatga attgcggttt tattacatta ataacccttc acctcagggg tttatgaaga 120
ggaaaggggtt ttatgcaaaa gaaagtgcga caattcctaa tcattttaga cacttttagga 180
gggggtgaag ttgtatgata aagcagatat ttttaattatt tggtatcttt ttgtattgca 240
agaaattttct tgctagtga tcaagaaaac atccagattg acagtctaaa atggctactg 300
gtatttttagt taattcaaaa atgaaacttt tcagtgatcc actttactaa cattctattt 360
gagaaggctt attggtaaaag ttt                                     383
```

<210> 455

<211> 383

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 455

```
actcctttan gacaaggaaa caggtatcag catgatggta gcagaaacct tatcaccaag 60
gtgcaggagc tgacttcttc caaagagttg tgggtccggg cagcgggtcat tgccgtgccc 120
attgctggag ggctgatttt agtgttgctt attatgttgg ccctgaggat gcttcgaagt 180
gaaaataaga ggctgcagga tcagcggcaa cagatgctct cccgtttgca ctacagcttt 240
cacggacacc attccaaaaa ggggcaggtt gcaaagttag acttggaatg catgggtgccg 300
gtcagtgggc acgagaactg ctgtctgacc tgtgataaaa tgagacaagc agacctcagc 360
aacgataaga tcctctcgct tgt                                     383
```

<210> 456

<211> 543

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(543)

<223> n = A,T,C or G

<400> 456

```
acaaacattt tacaaaaaag aacattacca atatcagtgg cagtaagggc aagctgaaga 60
atangtagac tgagtttccg ggcaatgtct gtcctcaaag acatccaaac tgcgttcagg 120
cagctgaaac aggttctttt cccagtgcga agcatatgtg gtcagtaata caaacgatgg 180
taaagtgggc tactacatag gcccagttaa caaactcctc ttctcctcgg gtaggccatg 240
atacaagtgg aactcatcaa ataatttaaa cccaaggcga taacaacact atttcccatc 300
taaactcatt taagccttca caatgtcgca atggattcag ttacttgcaa acgatcccgg 360
gttgtcatat agatacttgt tttttacaca taacgctgtg ccatcccttc cttcactgcc 420
ccagtcaggt ttctgttgtg tggaccgaaa ggggatacat tttagaaatg cttccctcaa 480
gacagaagtg agaaagaaag gagaccctga ggccaggatc tattaaacct ggtgtgtgcg 540
caa                                     543
```

<210> 457

<211> 544

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(544)

<223> n = A,T,C or G

<400> 457

```
actggtgcca atattgncat ggtgagctcc tctctaattgt cttccagggc accaatatct 60
gcccatgtca cattagggac agtgacaaag ccttcccttt tggcagaggg ttggactgag 120
gatagagcaa caatgaaatc attcagttca atgcacagtc cttgcatctg ctctcttgag 180
aggggatctt ggtctcttag caaccccagc agccttttga attcatcctg tgtttcagaa 240
gtgggctcag tttccagcct ttcctcctgg actccttttag atggcaaadc ttcattttca 300
ggatttttct tctgctgttc ctgtagcttc attaagactc tattgactgc acacattgct 360
gcctctcggc acagtgccat gagatcagca ccaacaaagc ctggagttag gtgtgctaag 420
tgacagaaat caaaagcttg aggaagcctc agttttctgc acaatgtttg aagtattctt 480
tccctggatg cttcatctgg gatacctagg catattttctc ggtcgaacct tcccgcacgt 540
ctca                                         544
```

<210> 458

<211> 382

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(382)

<223> n = A,T,C or G

<400> 458

```
acctntaggc tcaacggcag aanccttcacc acaaaagcga aatgggcaca ccacagggag 60
aaaactgggt gtcctggatg tttgaaaagt tggtcgttgt catgggtgtg tacttcatcc 120
tatctatcat taactccatg gcacaaagt atgccaaacg aatccagcag cggttgaact 180
cagaggagaa aactaaataa gtagagaaag ttttaaactg cagaaattgg agtggatggg 240
ttctgcctta aattgggagg actccaagcc gggaaggaaa attccctttt ccaacctgta 300
tcaattttta caactttttt cctgaaagca gtttagtcca tactttgcac tgacatactt 360
tttccttctg tgctaaggta ag                                         382
```

<210> 459

<211> 168

<212> DNA

<213> Homo sapiens

<400> 459

```
ctcgactact agccaggcac gaaaccatga agtagcctga tccttcttag ccatcctggc 60
cgccttagcg gtagtaactt tgtgttatga atcacatgaa agcatggaat cttatgaact 120
taatcccttc attaacagga gaaatgcaaa taccttcata tcccctca 168
```

<210> 460

<211> 190

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(190)

<223> n = A,T,C or G

<400> 460

```
acancctgcta ccagggagcc gagagctgac tatcccagcc tcggctaatag tattctacgc 60
catggatgga gcttcacacg atttctctct ggggcagcgg cgaaggctct ctactgctac 120
acctggcgct accagtggcc cgtctgcctc aggaactcct ccgagtgagg gaggaggggg 180
ctcctttccc                                     190
```

<210> 461

<211> 495

<212> DNA

<213> Homo sapiens

<400> 461

```
acagacagggc ttctctgcta tcctccagggc agtgtaatag tcaaggaaaa gggcaacagt 60
attggatcat tccttagaca ctaatcagct ggggaaagag ttcatggca aaagtgtcct 120
cccaagaatg gtttacacca agcagagagg acatgtcact gaatggggaa agggaacccc 180
cgtatccaca gtcactgtaa gcatccagta ggcaggaaga tggctttggg cagtggctgg 240
atgaaagcag atttgagata ccagctccg gaacgaggtc atcttctaca ggttcttcct 300
tactgagac aatgaattca gggatgatcat tctctgaggg gctgagaggt gcttctcga 360
ttttcactac cacattagct tggctctctg tctcagaggg tatctctaag actaggggct 420
tggtatata gtggtcaaaa cgaattagtt cattaatggc ttccagcttg gctgatgacg 480
tccccactga cagag                                     495
```

<210> 462

<211> 493

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(493)

<223> n = A,T,C or G

<400> 462

```
acactgaaac ataaatccgc aagtcaccac acatacaaca cccggcagga aaaaaacaaa 60
aacaggngt ttacatgac cctgtaacag ccattggctc aaactcagat gcttcctcca 120
tctgccagt gtgttttggg tacagagcac atcgtggctt ctggggtcac actcagctta 180
ggctgtgggt ccacagagca ctcatctggc tgggctatgg tgggtggggc tctactcaag 240
aagcaaagca gttaccagca cattcaaaca gtgtattgaa catcttttaa atatcaaagt 300
gagaaacaag aaggcaacat aataatgtta tcagaaagat gttaggaagt aaggacagct 360
gtgtaaagct tgaggctgaa aagtagcttg ccagcttcat ttctttgggt tcttgggtag 420
tgggcgccgg aacagcaaga tgtgaggttc tgggttcatg atcatataat ggacccatcc 480
ctgactctgc tga                                     493
```

<210> 463

<211> 3681

<212> DNA

<213> Homo sapiens

<400> 463

```
tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
cacccgtggg taattaacct ggcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
```

ctgacacagc	tgaaagcttg	gtggaaaaaa	cacctgatga	ggctgcaccc	ttggtggaaa	300
gaacacctga	cacggctgaa	agcttggtgg	aaaaaacacc	tgatgaggct	gcaccccttg	360
tggagggaac	atctgacaaa	attcaatggt	tggagaaagc	gacatctgga	aagttcgaac	420
agtcagcaga	agaaacacct	agggaaatta	cgagtcctgc	aaaagaaaac	tctgagaaat	480
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caagagtaac	atctaataaa	actaaaagtt	tggaaaaagg	aagatctaag	atgattgcat	720
gtcctacaaa	agaatcatct	acaaaagcaa	gtgccaatga	tcagagggtc	ccatcagaat	780
ccaaacaaga	ggaagatgaa	gaatatctct	gtgattctcg	gagtcctctt	gagagttctg	840
caaagattca	agtgtgtata	cctgagtcct	tatatcaaaa	agtaatggag	ataaatagag	900
aagtagaaga	gcctcctaag	aagccatctg	ccttcaagcc	tgccattgaa	atgcaaaact	960
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aagcagagcc	tccggggaag	ccatctgcct	tcgagcctgc	cactgaaatg	caaaagtctg	1320
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agttagagaa	ccaaaaagtt	aaatgggaac	aagagctctg	cagtgtgagg	tttctcacac	2460
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ttctgaagct	caaaggaaat	ccaaaagcct	aaaaattaat	ctcaattatg	cmggagactg	3000
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tcaacagcaa	ttagttcatg	cacataagaa	agctgacaac	aaaagcaaga	taacaattga	3240
tattcatatt	cttgagagga	aaatgcaaca	tcatctccta	aaagagaaaa	atgaggagat	3300
atttaattac	aataaccatt	taaaaaacct	tatatatcaa	tatgaaaaag	agaaagcaga	3360
aacagaaaac	tcatgagaga	caagcagtaa	gaaacttctt	ttggagaaac	aacagaccag	3420
atctttactc	acaactcatg	ctaggaggcc	agtcctagca	tcaccttatg	ttgaaaatct	3480
taccaatagt	ctgtgtcaac	agaatactta	ttttagaaga	aaaattcatg	atttcttctc	3540

gaagcctaca gacataaaat aacagtgtga agaattactt gttcacgaat tgcataaagc 3600
tgcacaggat tcccatctac cctgatgatg cagcagacat cattcaatcc aaccagaatc 3660
tcgctctgtc actcaggctg g 3681

<210> 464

<211> 1424

<212> DNA

<213> Homo sapiens

<400> 464

tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
caccctggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300
gaacacctga caggctgaa agcttgggtg aaaaaacacc tgatgaggct gcatecttgg 360
tggagggaac atctgacaaa attcaatgtt tggagaaagc gacatctgga aagttcgaac 420
agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaca tctgagaaat 480
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
ctagggaaat tatgagctcc gcaaaagaaa catctgagaa atttacgtgg gcagcaaaag 600
gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgcgtgg 660
caagagtaac atctaataaa actaaagttt tggaaaaagg aagatctaag atgattgcat 720
gtcctacaaa agaatcatct acaaaagcaa gtgccaatga tcagagggtc ccatcagaat 780
ccaaacaaga ggaagatgaa gaatattctt gtgattctcg gagtctcttt gagagtcttg 840
caaagattca agtgtgtata cctgagctta tatatcaaaa agtaatggag ataaatagag 900
aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960
ctgttccaaa taaagccttt gaattgaaga atgaacaaac attgagagca gatccgatgt 1020
tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctct 1080
gtgagactgt ttacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140
ataaaataaa tggaaaatta gaaggtaaga accgtttttt atttaaaaat cagttgaccg 1200
aatatttctc taaactgatg aggagggata tcctctagta gctgaagaaa attacctct 1260
aatgcaaac catggaaaaa aagagaagtg caatggtcgt aagttgtatg tctcatcagg 1320
tgttggcaac agactatatt gagagtgtctg aaaaggagct gaattattag tttgaattca 1380
agatattgca agacctgaga gaaaaaaaaa aaaaaaaaaa aaaa 1424

<210> 465

<211> 674

<212> DNA

<213> Homo sapiens

<400> 465

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<213> Homo sapiens

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141

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1337

<210> 468

<211> 2307

<212> DNA

<213> Homo sapiens

<400> 468

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tgggtctctg aaggctaact gcggaatgaa agtttctatt ccaactaaag ccttagaatt 240
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cattgaaatg caaaagtctg ttccaaataa agccttggaa ttgaagaatg acaaacattt 360
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142

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<210> 469

<211> 650

<212> PRT

<213> Homo sapiens

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<221> unsure

<222> (310)

<223> Xaa = Any Amino Acid<221> unsure

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<222> (522)

<223> Xaa = Any Amino Acid

<400> 469

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Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
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```

```

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
          35              40              45

```

```

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
          50              55              60

```

```

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
          65              70              75              80

```

```

Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
          85              90              95

```

```

Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
          100              105              110

```

```

Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
          115              120              125

```

```

Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
          130              135              140

```

```

Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
          145              150              155              160

```

```

Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu

```

143

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Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His	180	185		190	
Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn	195	200		205	
Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro	210	215		220	
Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro	225	230	235		240
Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser		245	250		255
Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala	260		265		270
Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser	275		280		285
Ser Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val	290	295		300	
Cys Leu Pro Lys Ala Xaa His Gln Lys Glu Ile Asp Lys Ile Asn Gly	305	310		315	320
Lys Leu Glu Gly Ser Pro Val Lys Asp Gly Leu Leu Lys Ala Asn Cys		325	330		335
Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met	340		345		350
Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro	355		360		365
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys	370	375		380	
Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys	385	390	395		400
Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu	405		410		415
Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Xaa His Gln Lys	420		425		430
Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asp Asn Asp	435	440		445	
Gly Phe Leu Lys Ala Pro Cys Arg Met Lys Val Ser Ile Pro Thr Lys	450	455		460	

144

Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro Glu
 465 470 475 480

Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val Pro
 485 490 495

Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Gln
 500 505 510

Met Phe Pro Ser Glu Ser Lys Gln Lys Xaa Val Glu Glu Asn Ser Trp
 515 520 525

Asp Ser Glu Ser Leu Arg Glu Thr Val Ser Gln Lys Asp Val Cys Val
 530 535 540

Pro Lys Ala Thr His Gln Lys Glu Met Asp Lys Ile Ser Gly Lys Leu
 545 550 555 560

Glu Asp Ser Thr Ser Leu Ser Lys Ile Leu Asp Thr Val His Ser Cys
 565 570 575

Glu Arg Ala Arg Glu Leu Gln Lys Asp His Cys Glu Gln Arg Thr Gly
 580 585 590

Lys Met Glu Gln Met Lys Lys Lys Phe Cys Val Leu Lys Lys Lys Leu
 595 600 605

Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu Glu Asn Gln Lys Val Lys
 610 615 620

Trp Glu Gln Glu Leu Cys Ser Val Arg Phe Leu Thr Leu Met Lys Met
 625 630 635 640

Lys Ile Ile Ser Tyr Met Lys Ile Ala Cys
 645 650

<210> 470

<211> 228

<212> PRT

<213> Homo sapiens

<400> 470

Met Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp Ala Ala Lys
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Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
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Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
 35 40 45

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
 50 55 60

145

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65 70 75 80
 Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
 85 90 95
 Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
 100 105 110
 Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
 115 120 125
 Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
 130 135 140
 Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
 145 150 155 160
 Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu
 165 170 175
 Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His
 180 185 190
 Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg
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 Phe Leu Phe Lys Asn Gln Leu Thr Glu Tyr Phe Ser Lys Leu Met Arg
 210 215 220
 Arg Asp Ile Leu
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<210> 471
 <211> 154
 <212> PRT
 <213> Homo sapiens

<220>
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 <222> (148)
 <223> Xaa = Any Amino Acid

<400> 471
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 Trp Trp Lys Lys His Leu Met Arg Leu His Pro Trp Trp Lys Glu His
 20 25 30
 Leu Thr Arg Leu Lys Ala Trp Trp Lys Lys His Leu Met Arg Leu His
 35 40 45

146

Pro Trp Trp Arg Glu His Leu Thr Lys Phe Asn Val Trp Arg Lys Arg
 50 55 60

His Leu Glu Ser Ser Asn Ser Gln Gln Lys Lys His Leu Gly Lys Leu
 65 70 75 80

Arg Val Leu Gln Lys Lys His Leu Arg Asn Leu Arg Gly Gln Gln Lys
 85 90 95

Glu Asp Leu Gly Arg Ser His Gly Arg Lys Lys Met Thr Gln Leu Arg
 100 105 110

Gln Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
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Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
 130 135 140

Lys Lys Lys Xaa Lys Lys Lys Lys Lys Lys
 145 150

<210> 472

<211> 467

<212> PRT

<213> Homo sapiens

<220>

<221> unsure

<222> (329)

<223> Xaa = Any Amino Acid

<400> 472

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Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
 20 25 30

Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
 35 40 45

Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
 50 55 60

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65 70 75 80

Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
 85 90 95

Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
 100 105 110

Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe

147

115	120	125
Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu		
130	135	140
Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu		
145	150	155 160
Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu		
	165	170 175
Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His		
	180	185 190
Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn		
	195	200 205
Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro		
	210	215 220
Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro		
	225	230 235 240
Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser		
	245	250 255
Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala		
	260	265 270
Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Asn		
	275	280 285
Ser Trp Asp Thr Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val		
	290	295 300
Cys Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly		
	305	310 315 320
Lys Leu Glu Gly Ser Pro Gly Lys Xaa Gly Leu Leu Lys Ala Asn Cys		
	325	330 335
Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met		
	340	345 350
Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro		
	355	360 365
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys		
	370	375 380
Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys		
	385	390 395 400
Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu		
	405	410 415

148

Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Ala His Gln Lys
 420 425 430

Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg Phe Leu
 435 440 445

Phe Lys Asn His Leu Thr Lys Tyr Phe Ser Lys Leu Met Arg Lys Asp
 450 455 460

Ile Leu
 465

<210> 473

<211> 445

<212> PRT

<213> Homo sapiens

<400> 473

Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Ser Pro Val Lys
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Asp Gly Leu Leu Lys Ala Asn Cys Gly Met Lys Val Ser Ile Pro Thr
 20 25 30

Lys Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro
 35 40 45

Glu Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val
 50 55 60

Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp
 65 70 75 80

Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser Ser
 85 90 95

Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val Cys
 100 105 110

Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys
 115 120 125

Leu Glu Glu Ser Pro Asp Asn Asp Gly Phe Leu Lys Ala Pro Cys Arg
 130 135 140

Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met Gln
 145 150 155 160

Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro Ala
 165 170 175

Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys Asn
 180 185 190

149

Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys Gln
 195 200 205
 Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu Thr
 210 215 220
 Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys Glu
 225 230 235 240
 Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser Lys
 245 250 255
 Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys
 260 265 270
 Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys
 275 280 285
 Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser
 290 295 300
 Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val
 305 310 315 320
 Arg Leu Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile
 325 330 335
 Leu Asn Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His
 340 345 350
 Arg Lys Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile
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 Gln Asp Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser
 370 375 380
 His Thr His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu
 385 390 395 400
 Lys Lys Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His
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 435 440 445

<210> 474

<211> 221

<212> DNA

<213> Homo sapiens

<220>

150

<221> misc_feature

<222> (1)...(221)

<223> n = A,T,C or G

<400> 474

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tcagaagata gggcacagcc attgccttgg cctcacttga agggctctgca tttgggtcct 180
ctgggtctctt gcccaagttc ccagccactc gagggagaaa t 221
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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 October 2000 (12.10.2000)

PCT

(10) International Publication Number
WO 00/60076 A3

(51) International Patent Classification⁷: **C12N 15/12**,
15/52, C07K 14/47, C12N 9/00, 5/10, 1/21, A61K 38/17,
39/00, C07K 16/30, 16/32, 16/40, A61K 39/395, 35/12,
C07K 19/00, C12N 15/62, 5/00, G01N 33/68, C12Q 1/68,
C12N 15/11

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(21) International Application Number: PCT/US00/05308

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(22) International Filing Date: 15 February 2000 (15.02.2000)

(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/285,480 2 April 1999 (02.04.1999) US
09/339,338 23 June 1999 (23.06.1999) US
09/389,681 2 September 1999 (02.09.1999) US
09/433,826 3 November 1999 (03.11.1999) US

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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Published:
— with international search report

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(88) Date of publication of the international search report:
20 December 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

(57) Abstract: Compositions and methods for the therapy and diagnosis of cancer, such as breast cancer, are disclosed. Compositions may comprise one or more breast tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a breast tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as breast cancer. Diagnostic methods based on detecting a breast tumor protein, or mRNA encoding such a protein, in a sample are also provided.

WO 00/60076 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/05308

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7	C12N15/12	C12N15/52	C07K14/47	C12N9/00	C12N5/10
	C12N1/21	A61K38/17	A61K39/00	C07K16/30	C07K16/32
	C07K16/40	A61K39/395	A61K35/12	C07K19/00	C12N15/62

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, STRAND, WPI Data, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 33915 A (HUMAN GENOME SCIENCES INC ;ROSEN CRAIG A (US); JI HONGJUN (US)) 6 August 1998 (1998-08-06) ---	
A	WO 96 29430 A (WAYNE JOHN CANCER INST ;NAT GENETICS INST (US)) 26 September 1996 (1996-09-26) ---	
X	WO 99 09155 A (ENDRESS GREGORY A ;FLORENCE KIMBERLY A (US); HUMAN GENOME SCIENCES) 25 February 1999 (1999-02-25) SEQ ID NO 65 -----	4,7

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance
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 "&" document member of the same patent family

Date of the actual completion of the international search

23 August 2000

Date of mailing of the international search report

21.11.00

Name and mailing address of the ISA

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VAN DER SCHAAL C.A.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/05308

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N5/00 G01N33/68 C12Q1/68 C12N15/11

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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VAN DER SCHAAL C.A.

INTERNATIONAL SEARCH REPORT

Int. application No.
PCT/US 00/05308

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 29-34 48 49 52 53 55-57 are (partially) directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Claims 1-79 Partially.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: Invention 1: Claims 1-79 partially

Polypeptide (portion) encoded by the polynucleotide sequence SEQ ID NO 2, the encoding polynucleotides, antibodies against the polypeptide and their uses

2. Claims: Inventions 2-464: claims 1-79 partially

(use of) a polypeptide (portion) encoded by the polynucleotide sequence selected from SEQ ID NO 1-175, 178 180 and 182-468, the encoding polynucleotides, or antibodies against the polypeptide as far as applicable

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/05308

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9833915 A	06-08-1998	AU 6257298 A EP 1015582 A	25-08-1998 05-07-2000
WO 9629430 A	26-09-1996	AU 5310296 A EP 0871768 A US 6057105 A	08-10-1996 21-10-1998 02-05-2000
WO 9909155 A	25-02-1999	AU 8910998 A EP 1005544 A AU 4682999 A WO 9966041 A AU 5212299 A AU 8910798 A WO 0004140 A	08-03-1999 07-06-2000 05-01-2000 23-12-1999 07-02-2000 08-03-1999 27-01-2000